



THE GOOD PRACTICE FOR UNDERSTAND BANDWIDTH CONTROL

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PRESENTER INFORMATION

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OBJECTIVE

Let everybody as don't know what's bandwidth control working, who are looking for the way understand bandwidth control and how to design and think for them solution about real require for which thing want to manage for bandwidth for every clients and use service like http, ssh, ftp etc..

WHAT'S BANDWIDTH CONTROL

When we are talk about bandwidth everybody be think about only 2 thing (download and upload) but for real uses, everybody be know only for download and every queue will be mention about how to control total bandwidth like

*** I want to limit speed upload/download***

But they are know or not, what's mean for "limit speed" the word as mark mean limit traffic for router outgoing interface.

So for us use bandwidth control we have to talk about only service connection for upload and download if we want to use service bandwidth control but if we want to only say all upload and download don't mind for service just only say for router interface

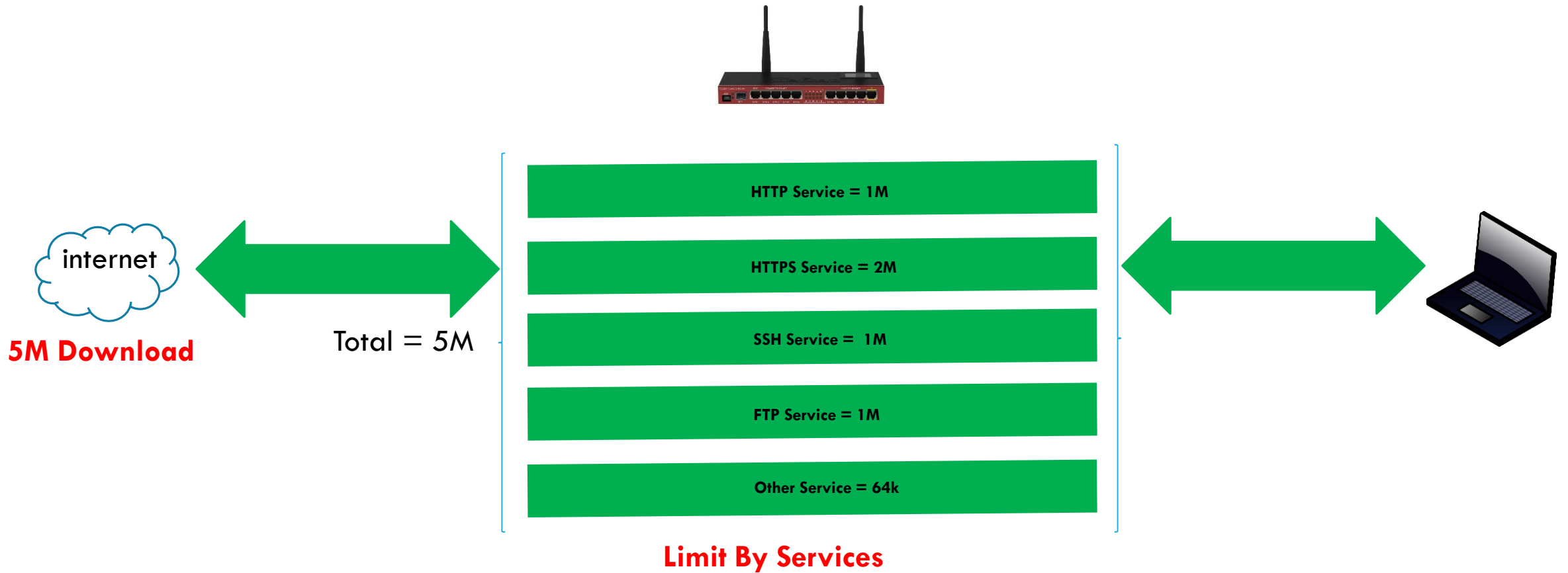
BANDWIDTH CONTROL CONCEPT



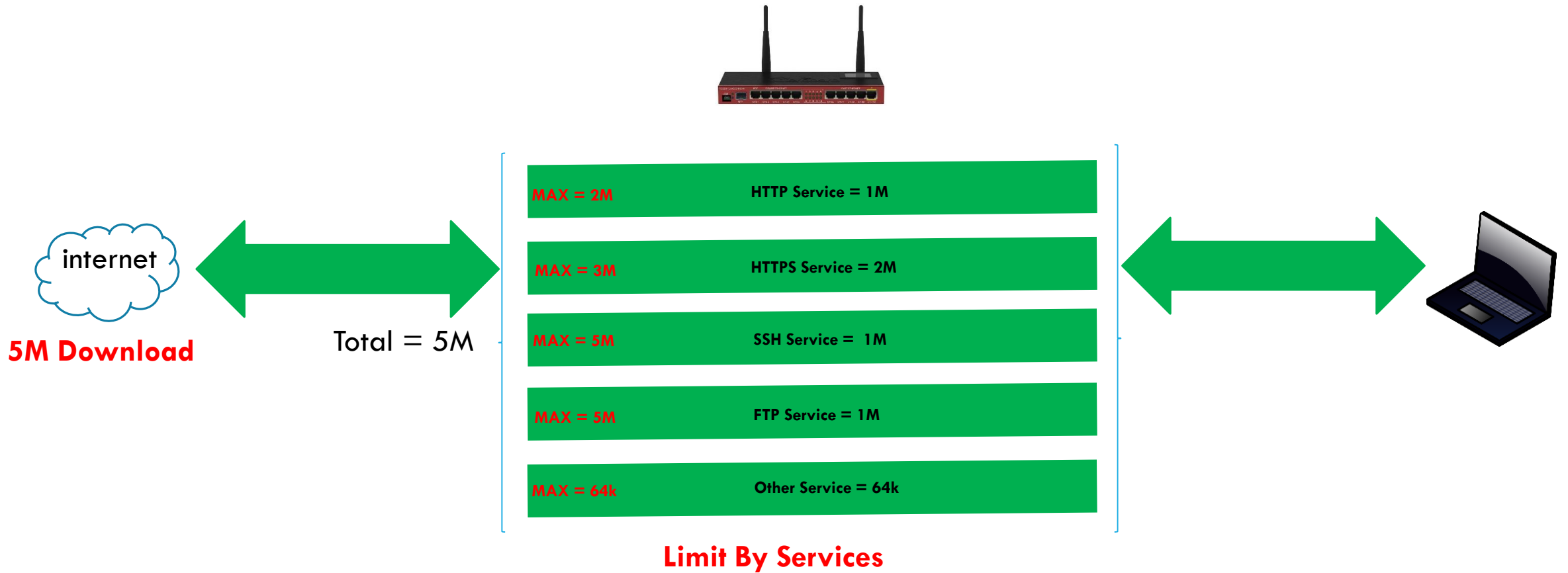
BANDWIDTH CONTROL CONCEPT



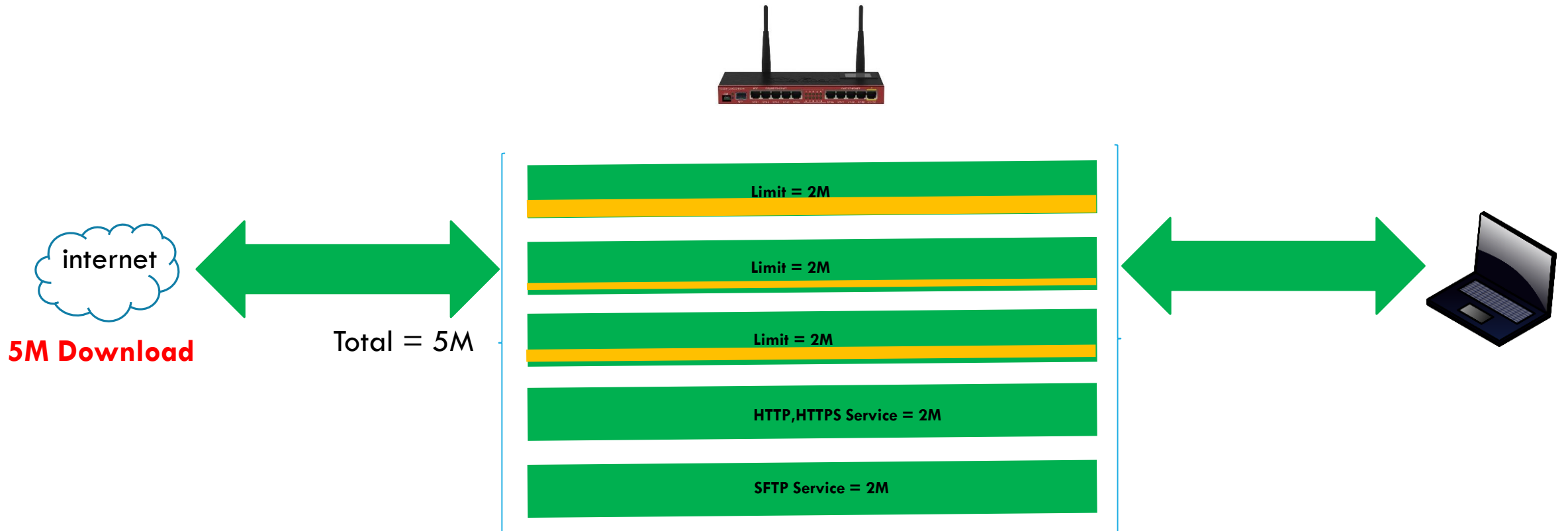
BANDWIDTH CONTROL CONCEPT



BANDWIDTH CONTROL CONCEPT

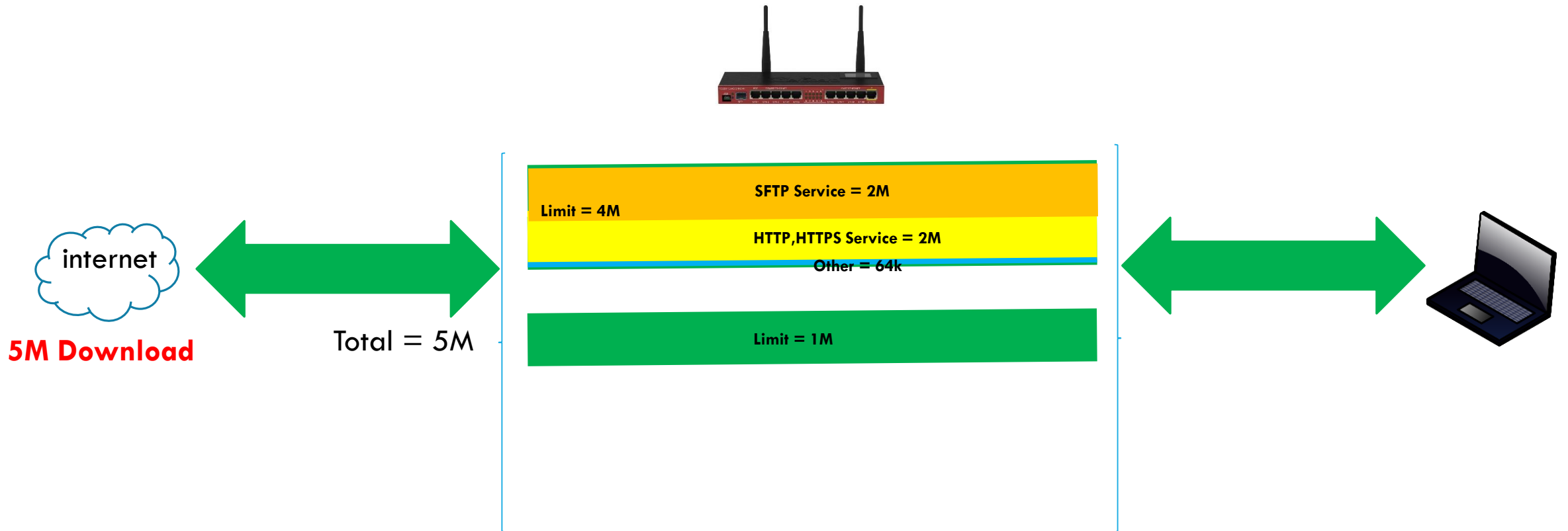


BANDWIDTH CONTROL CONCEPT



Limit for every Clients and Service Together

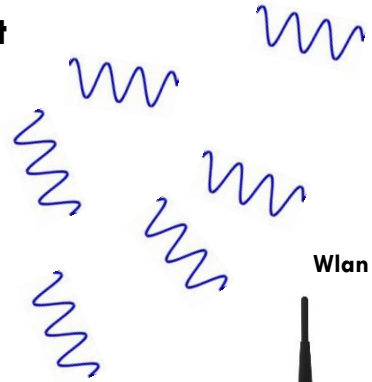
BANDWIDTH CONTROL CONCEPT



Limit for every Clients and Service Together

IDEA FOR DESIGN TOTAL BANDWIDTH CONTROL

internet
5M/1M



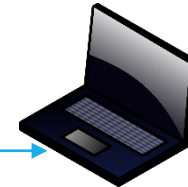
Limit 2M/1M

Wlan 1



Ether 5

Router IP : 192.168.10.1/24



IP : 192.168.10.254/24
GW : 192.168.10.1
DNS : 192.168.10.1

Simple Queue <limit>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Name: limit

Target: 192.168.10.0/24

Dst.: []

Target Upload: [] Target Download: []

Max Limit: 1M [] 2M [] bits/s

Simple Queue <limit>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Name: limit

Target: ether5

Dst.: []

Target Upload: [] Target Download: []

Max Limit: 1M [] 2M [] bits/s

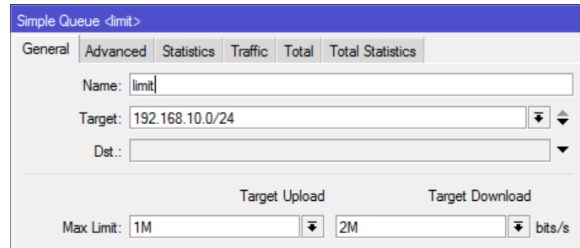
Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

[+] [-] [x] [y] [z] [v] [w] [aa] Reset Counters [bb] Reset All Counters

Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...
download	ether5	local_packet		2M	1352 bps
upload	wlan1	local_packet		1M	2.2 kbps

SIMPLE QUEUE CONTROL TOTAL BANDWIDTH



Simple Queue <limit>

General Advanced Statistics Traffic Total Total Statistics

Name: limit

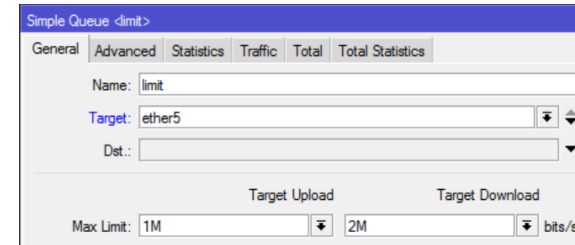
Target: 192.168.10.0/24

Dst.:

Target Upload Target Download

Max Limit: 1M 2M bits/s

=



Simple Queue <limit>

General Advanced Statistics Traffic Total Total Statistics

Name: limit

Target: ether5

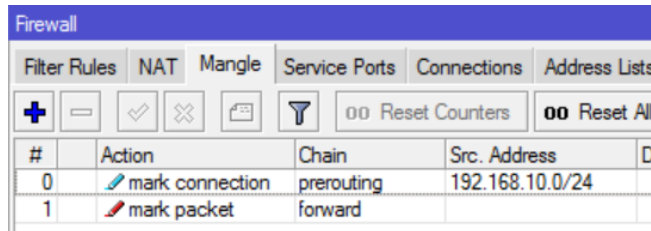
Dst.:

Target Upload Target Download

Max Limit: 1M 2M bits/s

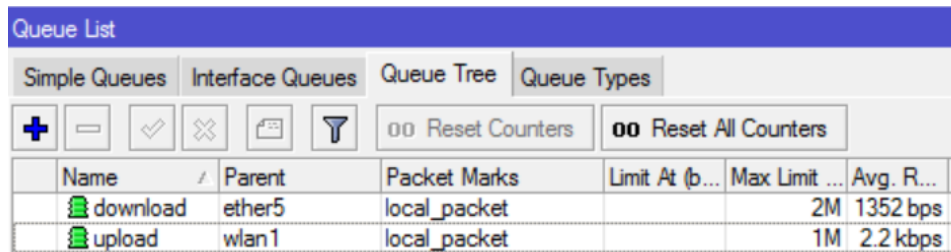
Target can be select local interface or network IP
Address the result almost same you can limit
upload/download

QUEUE TREE CONTROL TOTAL BANDWIDTH



#	Action	Chain	Src. Address
0	mark connection	prerouting	192.168.10.0/24
1	mark packet	forward	

We have to mark connection and use that to mark packet before use in queue tree



Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...
download	ether5	local_packet		2M	1352 bps
upload	wlan1	local_packet		1M	2.2 kbps

COMPARE THE WAY CONTROL BANDWIDTH

Simple Queue <limit>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Name: limit

Target: 192.168.10.0/24

Dst.:

Target Upload Target Download

Max Limit: 1M 2M bits/s

Simple Queue <limit>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Name: limit

Target: ether5

Dst.:

Target Upload Target Download

Max Limit: 1M 2M bits/s

We can use 3 way for control total bandwidth/traffic, so the simple way if you require control total bandwidth Simple Queue be easy for use

Queue List

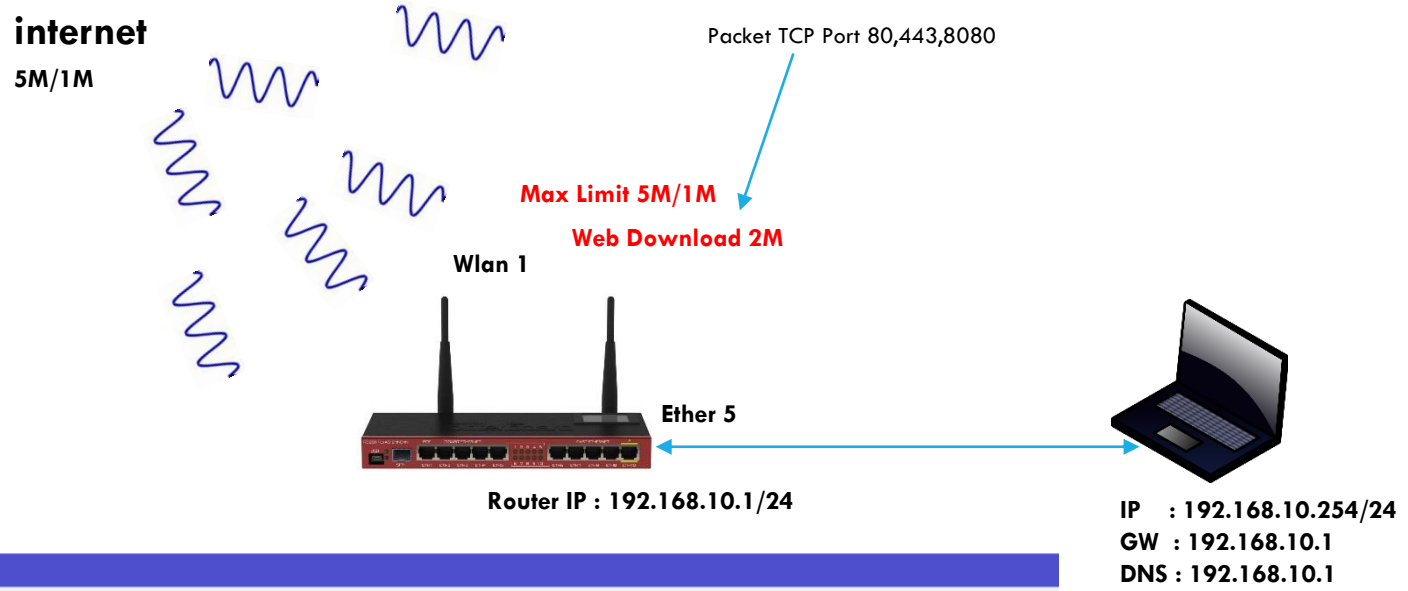
Simple Queues | Interface Queues | Queue Tree | Queue Types

+ - ✓ ✗ 🗑️ 🗑️

00 Reset Counters 00 Reset All Counters

Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...
download	ether5	local_packet		2M	1352 bps
upload	wlan1	local_packet		1M	2.2 kbps

IDEA FOR DESIGN SERVICES BANDWIDTH CONTROL



Firewall										
Filter Rules										
#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark
0	mark packet	forward			6 (tcp)	80,443,8080				WEB_Download_Packet
1	mark packet	forward			6 (tcp)		80,443,8080			WEB_Upload_Packet

POPULAR SERVICE PORT FOR USE

Port Number	Service Name
20 & 21	File Transfer Protocol (FTP)
22	Secure Shell (SSH)
23	Telnet remote login service
25	Simple Mail Transfer Protocol (SMTP)
53	Domain Name System (DNS) service
80	Hypertext Transfer Protocol (HTTP) used in the World Wide Web
110	Post Office Protocol (POP3)
119	Network News Transfer Protocol (NNTP)
143	Internet Message Access Protocol (IMAP)
161	Simple Network Management Protocol (SNMP)
465	SMTP Secure (SMTPS)
443	HTTP Secure (HTTPS)

SIMPLE QUEUE CONTROL SERVICES BANDWIDTH

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

+ - ✓ ✕ 📄 🗑️ 00 Reset Counters 00 Reset All Counters

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0	limit	ether5	1M	5M	
1	web_download	192.168.10.0/24	unlimited	2M	WEB_Download_Packet
2	web_upload	192.168.10.0/24	768k	unlimited	WEB_Upload_Packet

Simple Queue <web_download>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Name: web_download

Target: 192.168.10.0/24

Dst.:

Target Upload Target Download

Max Limit: unlimited 2M bits/s

Simple Queue <web_download>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Packet Marks: WEB_Download_Packet

SIMPLE QUEUE CONTROL SERVICES BANDWIDTH

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

+ - ✓ ✕ 📄 🗑️ 00 Reset Counters 00 Reset All Counters

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0	limit	ether5	1M	5M	
1	web_download	192.168.10.0/24	unlimited	2M	WEB_Download_Packet
2	web_upload	192.168.10.0/24	768k	unlimited	WEB_Upload_Packet

Simple Queue <web_upload>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Name: web_upload

Target: 192.168.10.0/24

Dst.:

Target Upload Target Download

Max Limit: 768k unlimited bits/s

Simple Queue <web_upload>

General | Advanced | Statistics | Traffic | Total | Total Statistics

Packet Marks: WEB_Upload_Packet

QUEUE TREE CONTROL SERVICES BANDWIDTH

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✕ ☰ ⚙ 00 Reset Counters 00 Reset All Counters

Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...
download	ether5	WEB_Download_Packet		2M	15.5 kb...
upload	wlan1	WEB_Upload_Packet		1M	496.4 k...

TRICK FOR MARK SERVICE PACKET

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✕ [icon] 00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark
0	mark packet	forward			6 (tcp)	80,443,8080				WEB_Download_Packet
1	mark packet	forward			6 (tcp)		80,443,8080			WEB_Upload_Packet

Mangle Rule <80,443,8080>

General Advanced Extra Action Statistics

Chain: forward

Src. Address:

Dst. Address:

Protocol: 6 (tcp)

Src. Port: 80,443,8080

Dst. Port:

Any. Port:

P2P:

In. Interface:

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

Mangle Rule <80,443,8080>

General Advanced Extra Action Statistics

Chain: forward

Src. Address:

Dst. Address:

Protocol: 6 (tcp)

Src. Port:

Dst. Port: 80,443,8080

Any. Port:

P2P:

In. Interface:

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

Src. Port : use for Mark Download
Dst. Port : use for Mark Upload

QUEUE TREE CONTROL SERVICE BANDWIDTH

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✕ 🗑️ 🏠 00 Reset Counters 00 Reset All Counters

Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...	C
download	ether5			5M	14.3 kb...	
web_download	download	WEB_Download_Packet	2M	3M	14.3 kb...	
upload	wlan1			2M	499.2 k...	
web_upload	upload	WEB_Upload_Packet	1M	2M	425.5 k...	

BOTH WAY FOR BANDWIDTH CONTROL

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ ☰ ☹ ☹ Reset Counters ☹ Reset All Counters

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0	limit	ether5	1M	5M	
1	web_download	192.168.10.0/24	unlimited	2M	WEB_Download_Packet
2	web_upload	192.168.10.0/24	768k	unlimited	WEB_Upload_Packet

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ ☰ ☹ ☹ Reset Counters ☹ Reset All Counters

Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...
download	ether5			5M	14.3 kb...
web_download	download	WEB_Download_Packet	2M	3M	14.3 kb...
upload	wlan1			2M	499.2 k...
web_upload	upload	WEB_Upload_Packet	1M	2M	425.5 k...

IMPORTANT FOR QUEUE

Simple Queue

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

+ - ✓ ✕ ☰ ⏏ 00 Reset Counters 00 Reset All Counters

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0	limit	ether5	1M	5M	
1	web_download	192.168.10.0/24	unlimited	2M	WEB_Download_Packet
2	web_upload	192.168.10.0/24	768k	unlimited	WEB_Upload_Packet

Queue Tree

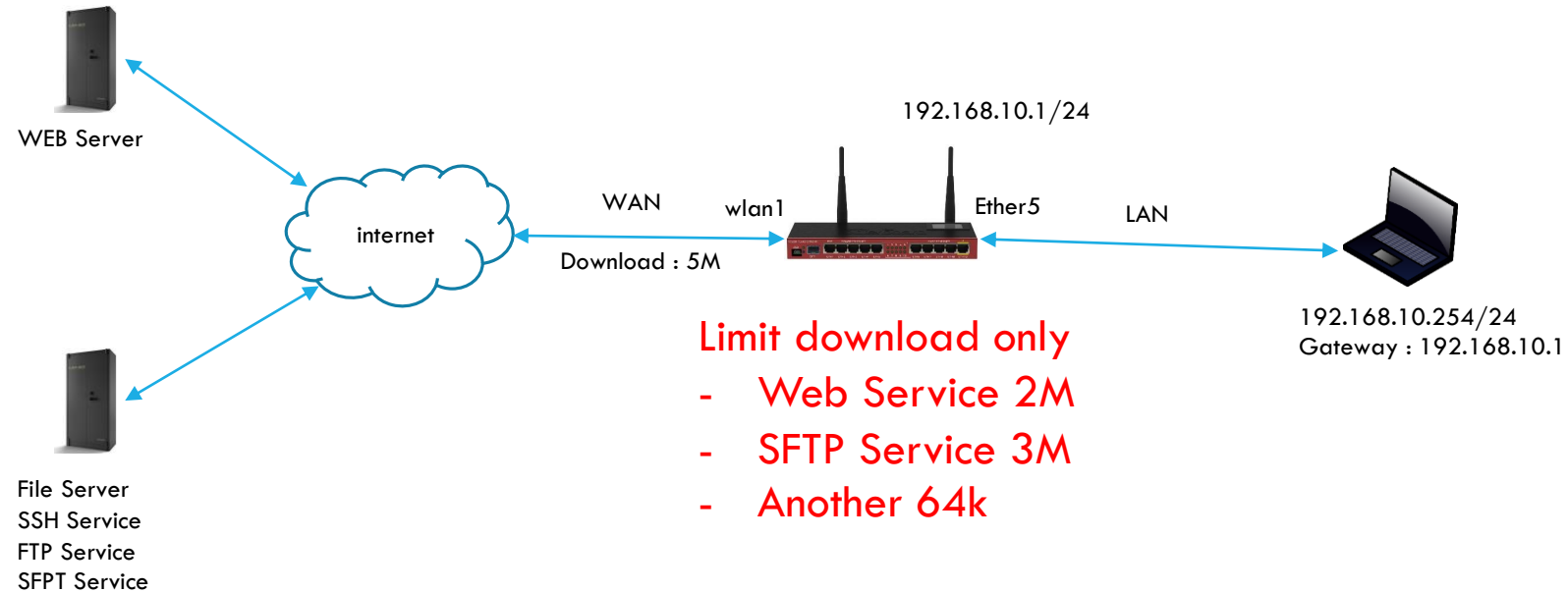
Firewall

Filter Rules | NAT | Mangle | Service Ports | Connections | Address Lists | Layer7 Protocols

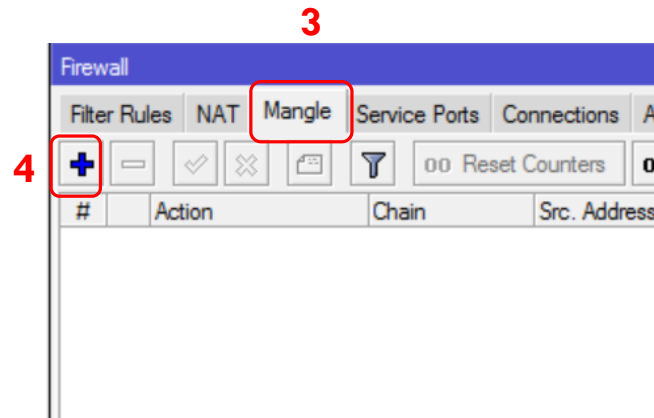
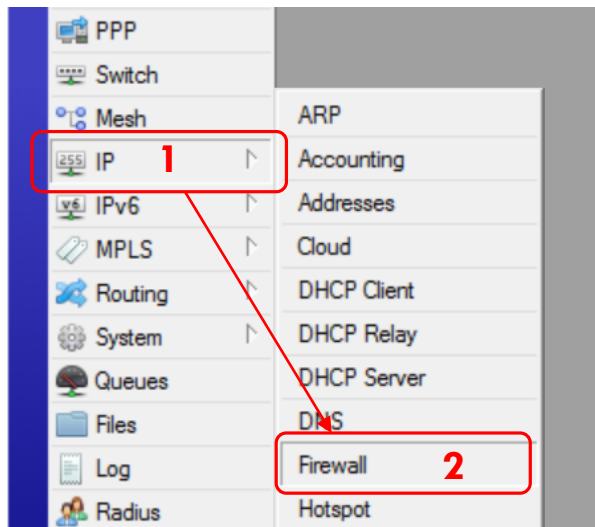
+ - ✓ ✕ ☰ ⏏ 00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark
0	mark packet	forward			6 (tcp)	80,443,8080				WEB_Download_Packet
1	mark packet	forward			6 (tcp)		80,443,8080			WEB_Upload_Packet

SOLUTION FOR SIMPLE CONTROL BANDWIDTH



QUEUE CONFIGURATION FOR SOLUTION



QUEUE CONFIGURATION FOR SOLUTION

The image illustrates the configuration of a Mangle rule in Mikrotik WinBox. It shows two screenshots of the 'New Mangle Rule' dialog box. The first screenshot shows the 'General' tab with the following settings: Chain: prerouting, Src. Address: 192.168.10.0/24, and Dst. Address: (empty). The second screenshot shows the 'Action' tab with the following settings: Action: mark connection, Log: (unchecked), Log Prefix: (empty), New Connection Mark: local_conn, and Passthrough: (checked). A red arrow points from the 'General' tab to the 'Action' tab, and another red arrow points from the 'Action' tab to the Firewall rule list.

Firewall

#	Action	Chain	Src. Address	Dst. Address
0	mark connection	prerouting	192.168.10.0/24	

QUEUE CONFIGURATION FOR SOLUTION

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [Filter] [Reset Counters] [Reset All Counters]

#	Action	Chain	Src. Address	Dst. Address	P
0	mark connection	prerouting	192.168.10.0/24		F

New Mangle Rule

General Advanced Extra Action Statistics

Chain: forward

Src. Address: []

Dst. Address: []

Protocol: [6 (tcp)]

Src. Port: [80,443,8080]

Dst. Port: []

Any. Port: []

P2P: []

In. Interface: []

Out. Interface: []

Packet Mark: []

Connection Mark: [local_conn]

Routing Mark: []

Routing Table: []

Connection Type: []

Connection State: []

Connection NAT State: []

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

New Mangle Rule

General Advanced Extra Action Statistics

Action: mark packet

Log

Log Prefix: []

New Packet Mark: WEB_Packet

Passthrough

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [Filter] [Reset Counters] [Reset All Counters]

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark	Bytes
0	mark connection	prerouting	192.168.10.0/24								566.9 KiB
1	mark packet	forward			6 (tcp)	80,443,8080				WEB_Packet	232.4 KiB

QUEUE CONFIGURATION FOR SOLUTION

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [Filter Icon] 00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	F
0	mark connection	prerouting	192.168.10.0/24		

New Mangle Rule

General Advanced Extra Action Statistics

Chain: forward

Src. Address: []

Dst. Address: []

Protocol: 6 (tcp)

Src. Port: 22

Dst. Port: []

Any. Port: []

P2P: []

In. Interface: []

Out. Interface: []

Packet Mark: []

Connection Mark: local_conn

Routing Mark: []

Routing Table: []

Connection Type: []

Connection State: []

Connection NAT State: []

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

New Mangle Rule

General Advanced Extra Action Statistics

Action: mark packet

Log

Log Prefix: []

New Packet Mark: SFTP_Packet

Passthrough

OK Cancel Apply Disable Comment Copy Remove Reset Counters Reset All Counters

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ [Filter Icon] 00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark	Bytes	F
0	mark connection	prerouting	192.168.10.0/24								566.9 KB	
1	mark packet	forward			6 (tcp)	80,443,8080				WEB_Packet	232.4 KB	
2	mark packet	forward			6 (tcp)	22				SFTP_Packet	0 B	

QUEUE CONFIGURATION FOR SOLUTION

#	Action	Chain	Src. Address	Dst. Address	F
0	mark connection	prerouting	192.168.10.0/24		F

General Advanced Extra Action Statistics

Chain: forward

Src. Address: [empty]

Dst. Address: [empty]

Protocol: 6 (tcp)

Src. Port: 80,443,8080,22

Dst. Port: [empty]

Any. Port: [empty]

P2P: [empty]

In. Interface: [empty]

Out. Interface: [empty]

Packet Mark: [empty]

Connection Mark: local_conn

Routing Mark: [empty]

Routing Table: [empty]

Connection Type: [empty]

Connection State: [empty]

Connection NAT State: [empty]

Buttons: OK, Cancel, Apply, Disable, Comment, Copy, Remove, Reset Counters, Reset All Counters

General Advanced Extra Action Statistics

Action: mark packet

Log

Log Prefix: [empty]

New Packet Mark: Other_Packet

Passthrough

Buttons: OK, Cancel, Apply, Disable, Comment, Copy, Remove, Reset Counters, Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark	Bytes	Pa
0	mark connection	prerouting	192.168.10.0/24								37.6 MiB	
1	mark packet	forward			6 (tcp)	80,443,8080				WEB_Packet	37.0 MiB	
2	mark packet	forward			6 (tcp)	22				SFT_Packet	0 B	
3	mark packet	forward			6 (tcp)	180,443,8080,22				Other_Packet	48.6 MiB	

QUEUE CONFIGURATION FOR SOLUTION

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ 📄 🔍 00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark
0	mark connection	prerouting	192.168.10.0/24							
1	mark packet	forward			6 (tcp)	80,443,8080				WEB_Packet
2	mark packet	forward			6 (tcp)	22				SFTP_Packet
3	mark packet	forward			6 (tcp)	!80,443,8080,22				Other_Packet

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ 📄 🔍 00 Reset Counters 00 Reset All Counters Find

Name	Parent	Packet Marks	Limit At (b...	Max Limit ...	Avg. R...	Queue
download	ether5			5M	1032 bps	
other_download	download	Other_Packet	64k	64k	0 bps	
sftp_download	download	SFTP_Packet	3M	5M	0 bps	
web_download	download	WEB_Packet	2M	3M	1032 bps	

4 items 0 B queued 0 packets queued

QUEUE CONFIGURATION FOR SOLUTION

MAX Limit : 64k
Limit at : 64k

Queue <other_download>

General Statistics

Name: other_download

Parent: download

Packet Marks: Other_Packet

Queue Type: default

Priority: 8

Limit At: 64k bits/s

Max Limit: 64k bits/s

Burst Limit: bits/s

Burst Threshold: bits/s

Burst Time: s

MAX Limit : 5M
Limit at : 3M

Queue <sftp_download>

General Statistics

Name: sftp_download

Parent: download

Packet Marks: SFTP_Packet

Queue Type: default

Priority: 8

Limit At: 3M bits/s

Max Limit: 5M bits/s

Burst Limit: bits/s

Burst Threshold: bits/s

Burst Time: s

MAX Limit : 3M
Limit at : 2M

Queue <web_download>

General Statistics

Name: web_download

Parent: download

Packet Marks: WEB_Packet

Queue Type: default

Priority: 8

Limit At: 2M bits/s

Max Limit: 3M bits/s

Burst Limit: bits/s

Burst Threshold: bits/s

Burst Time: s

MAX Limit : 5M

Queue <download>

General Statistics

Name: download

Parent: ether5

Packet Marks:

Queue Type: default

Priority: 8

Limit At: bits/s

Max Limit: 5M bits/s

Burst Limit: bits/s

Burst Threshold: bits/s

Burst Time: s

QUEUE CONFIGURATION FOR SOLUTION

Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols

+ - ✓ ✗ 📄 🔍 00 Reset Counters 00 Reset All Counters

#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Int...	New Packet Mark	Bytes
0	mark connection	prerouting	192.168.10.0/24								55.1 MiB
1	mark packet	forward			6 (tcp)	80,443,8080				WEB_Packet	58.3 MiB
2	mark packet	forward			6 (tcp)	22				SFTP_Packet	0 B
3	mark packet	forward			6 (tcp)	180,443,8080,22				Other_Packet	63.4 MiB

Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ 📄 🔍 00 Reset Counters 00 Reset All Counters Find

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0	limit	ether5	1M	5M	
2	queue1	192.168.10.0/24	unlimited	64k	Other_Packet
3	sftp_download	192.168.10.0/24	unlimited	5M	SFTP_Packet
1	web_download	192.168.10.0/24	unlimited	3M	WEB_Packet

4 items 0 B queued 0 packets queued

QUEUE CONFIGURATION FOR SOLUTION

The image displays the Mikrotik WinBox interface for configuring queues. The main window, 'Queue List', shows a table of configured queues:

#	Name	Target	Upload Max Limit	Download Max Limit	Packet Marks
0	limit	ether5	1M	5M	
2	another_download	192.168.10.0/24	unlimited	64k	Other_Packet
3	sftp_download	192.168.10.0/24	unlimited	5M	SFTP_Packet
1	web_download	192.168.10.0/24	unlimited	3M	WEB_Packet

Below the table, three configuration windows are shown for individual queues:

- Simple Queue <limit>**: Name: limit, Target: ether5, Max Limit: 1M, Target Download: 5M bits/s.
- Simple Queue <another_download>**: Packet Marks: Other_Packet, Limit At: unlimited, Target Upload: 64k, Priority: 8, Queue Type: default-small, Parent: limit.
- Simple Queue <sftp_download>**: Packet Marks: SFTP_Packet, Limit At: unlimited, Target Upload: 3M, Priority: 8, Queue Type: default-small, Parent: limit.
- Simple Queue <web_download>**: Name: web_download, Target: 192.168.10.0/24, Max Limit: unlimited, Target Download: 3M bits/s.

All queues are shown as 'enabled' at the bottom of their respective configuration windows.

THANKS YOU

Question !!!!!

You can download this document from

<http://mikrotik.kapnetwork.com>