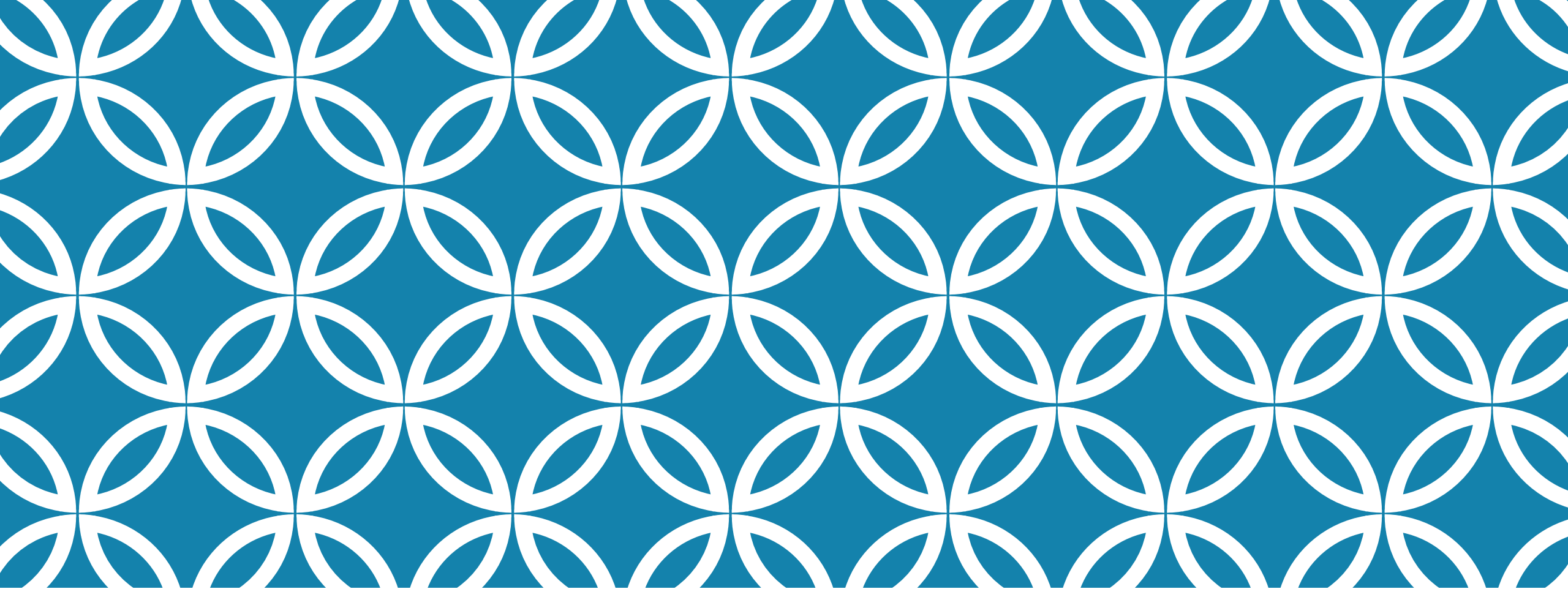




THE GOOD PRACTICE FOR UNDERSTAND BANDWIDTH CONTROL

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Thailand MUM 2015

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

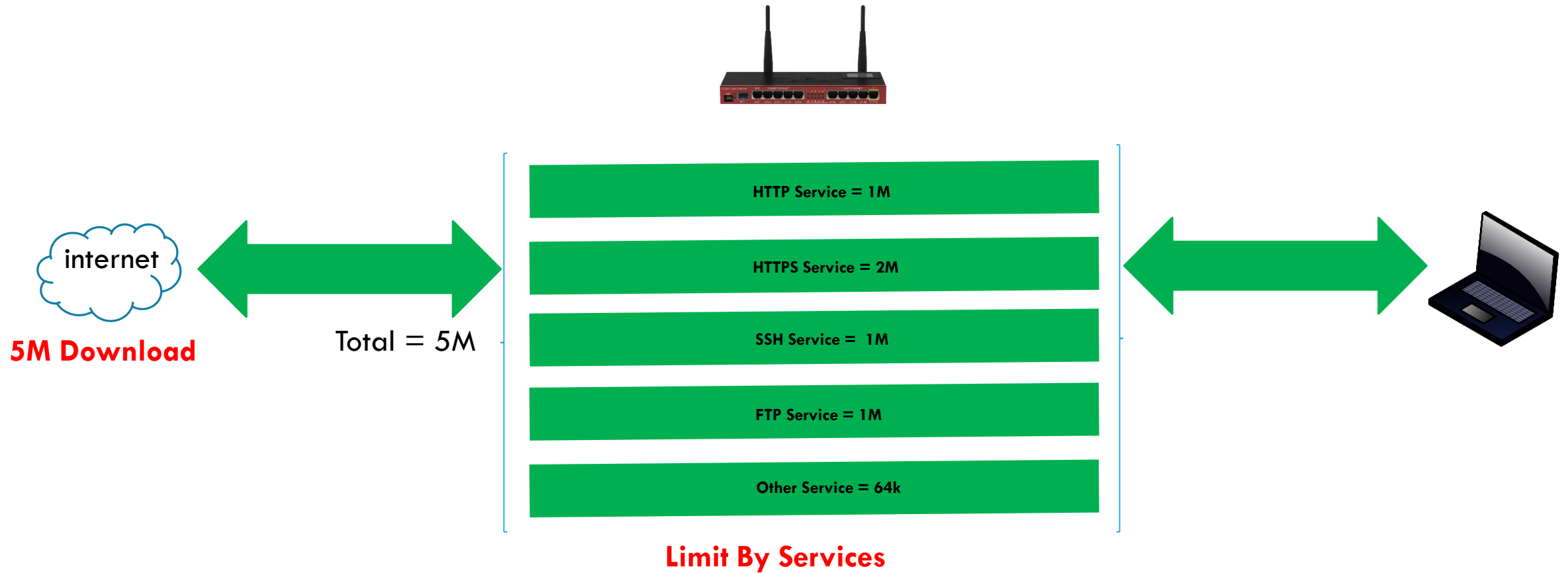
BANDWIDTH CONTROL CONCEPT



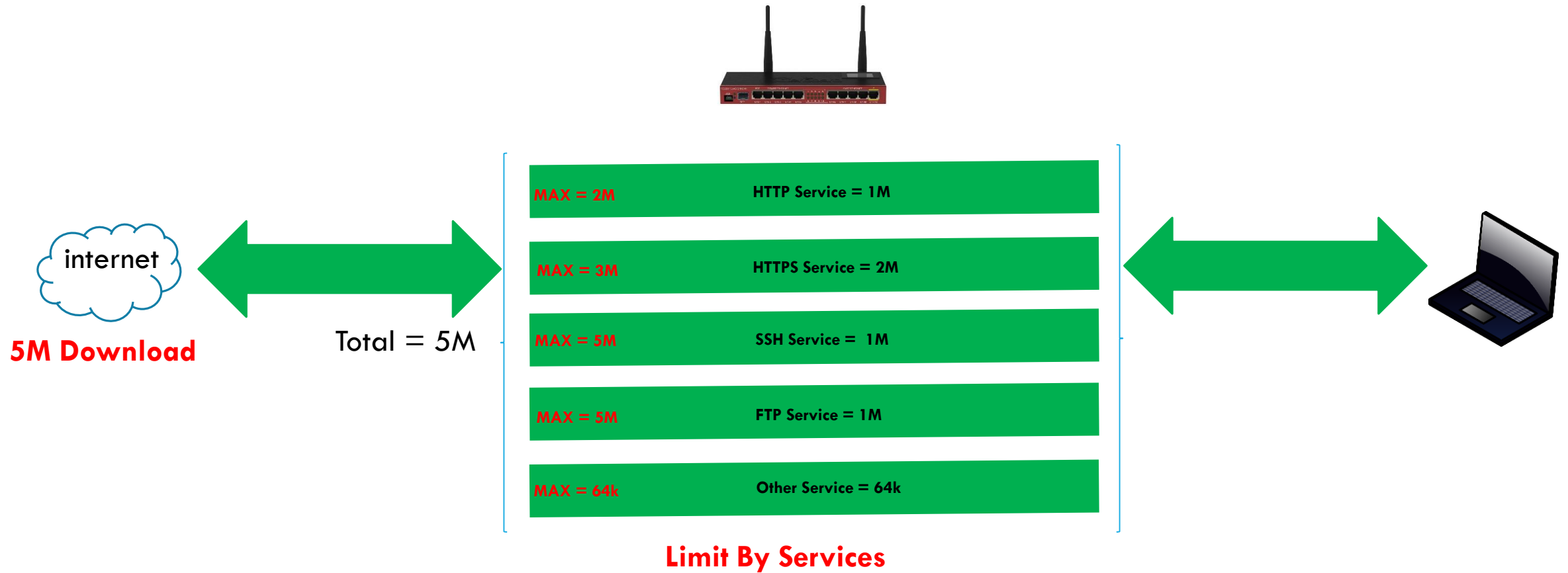
BANDWIDTH CONTROL CONCEPT



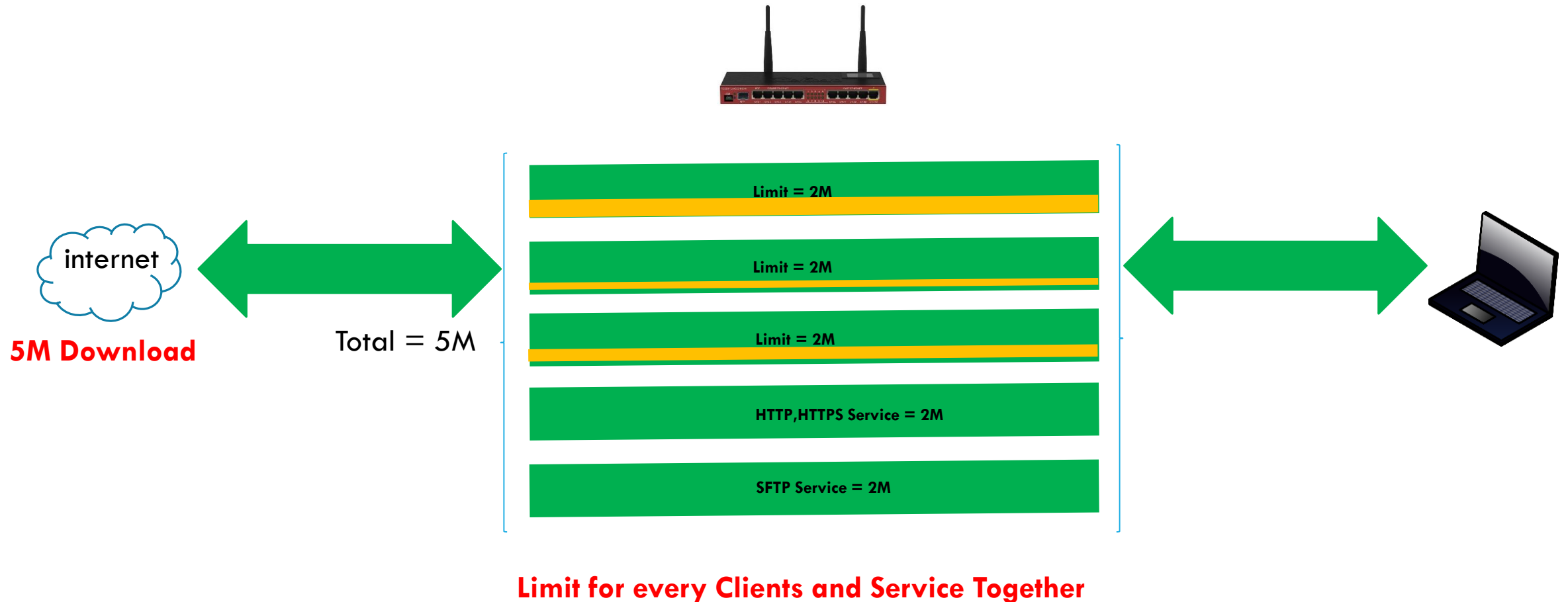
BANDWIDTH CONTROL CONCEPT



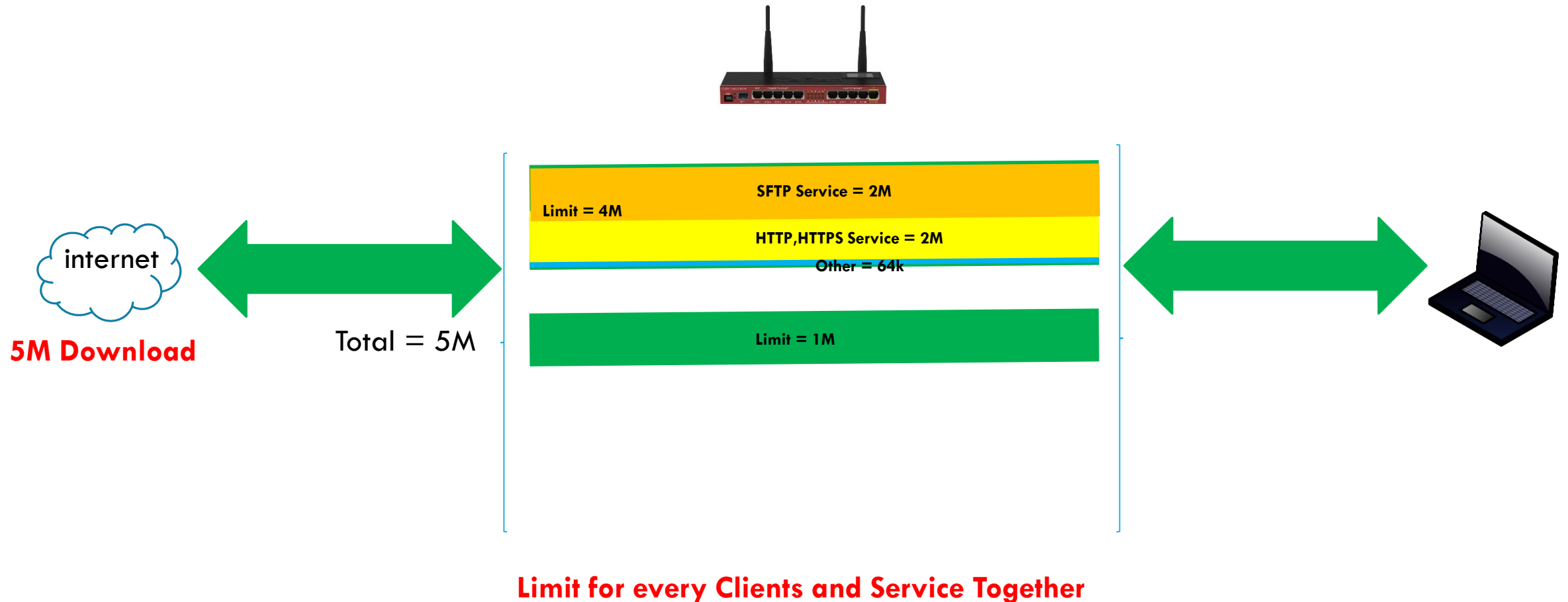
BANDWIDTH CONTROL CONCEPT



BANDWIDTH CONTROL CONCEPT



BANDWIDTH CONTROL CONCEPT



internet
5M/1M

The screenshot shows the 'Simple Queue' configuration window with the 'Advanced' tab selected. The 'Name' field is set to 'limit'. The 'Target' field is set to '192.168.10.0/24'. The 'Dst.' field is empty. The 'Target Upload' and 'Target Download' sections are visible, with 'Max Limit' set to '1M' for upload and '2M' for download. The units are '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

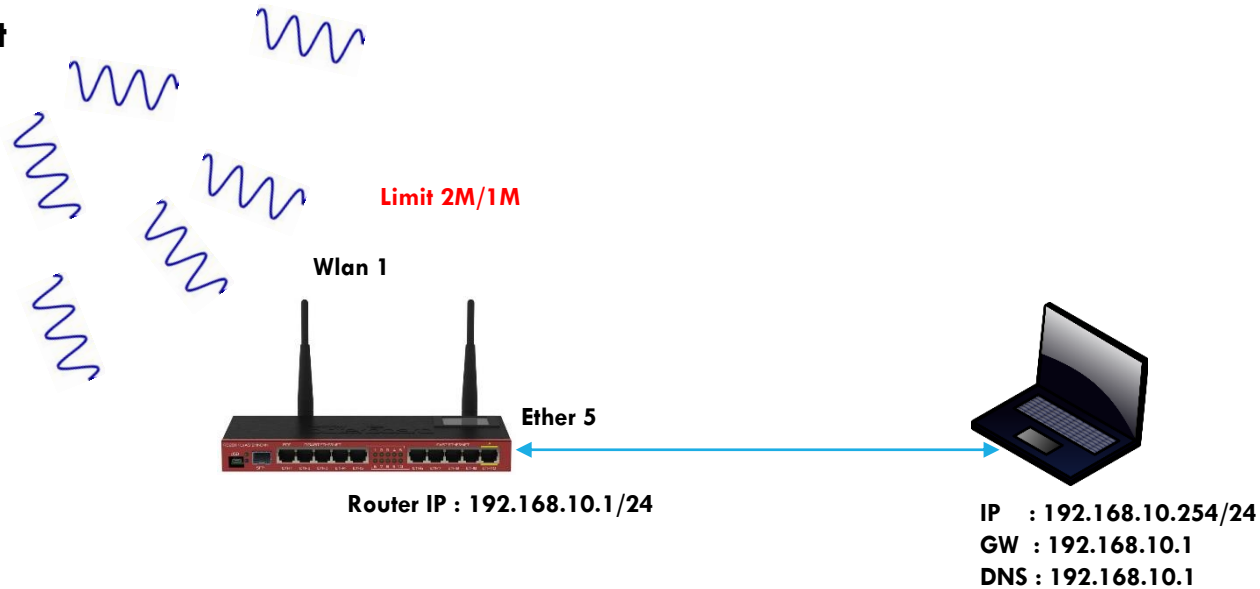




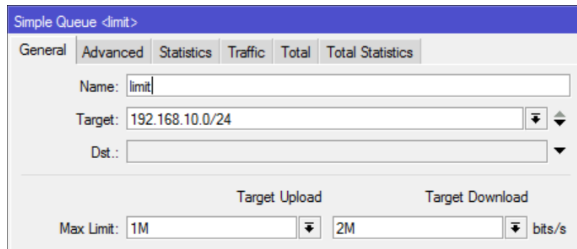



00 Reset Counters 00 Reset All Counters

	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



SIMPLE QUEUE CONTROL TOTAL BANDWIDTH



Simple Queue <limit>

General Advanced Statistics Traffic Total Total Statistics

Name: limit

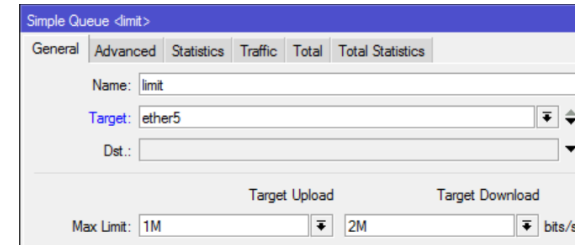
Target: 192.168.10.0/24

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

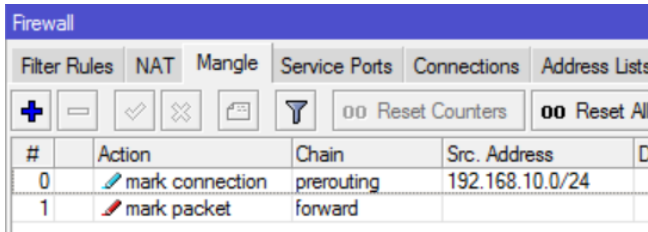
Dst.:

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



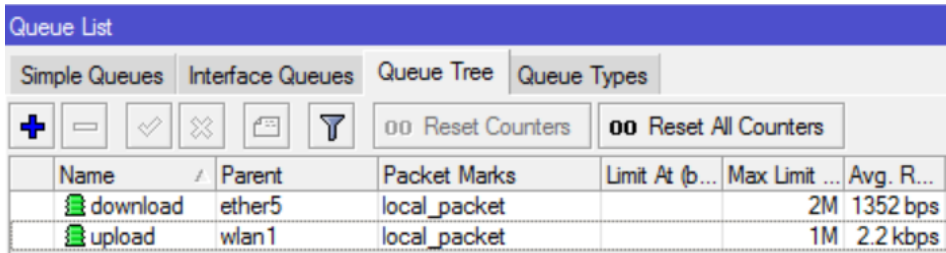
Firewall

Filter Rules NAT Mangle Service Ports Connections Address Lists

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

#	Action	Chain	Src. Address	Dst. 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



Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✕ [icon] [icon] 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

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

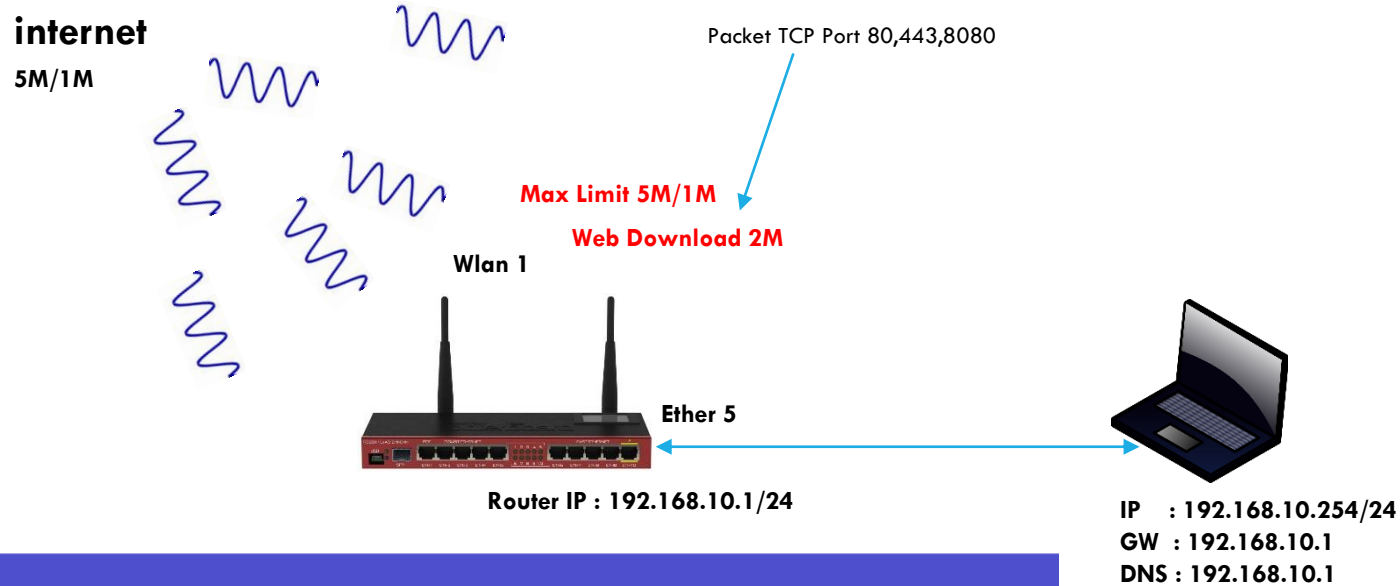
Queue List

Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ [icon] [icon] 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										
NAT Mangle Service Ports Connections Address Lists Layer7 Protocols										
+ - [check] [x] [info] [filter] 00 Reset Counters 00 Reset All Counters										
#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	In. Inter...	Out. Inter...	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 Counters00 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 Counters00 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>

GeneralAdvancedStatisticsTrafficTotalTotal 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>

GeneralAdvancedStatisticsTrafficTotalTotal Statistics

Packet Marks: WEB_Upload_Packet

Queue List

Simple Queues

Interface Queues

Queue Tree

Queue Types

+

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☰

⌵

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						
+ - ✓ ✗ 📄 🔍 00 Reset Counters00 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						
+ - ✓ ✗ 📄 🔍 00 Reset Counters00 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...

Simple Queue

Queue List

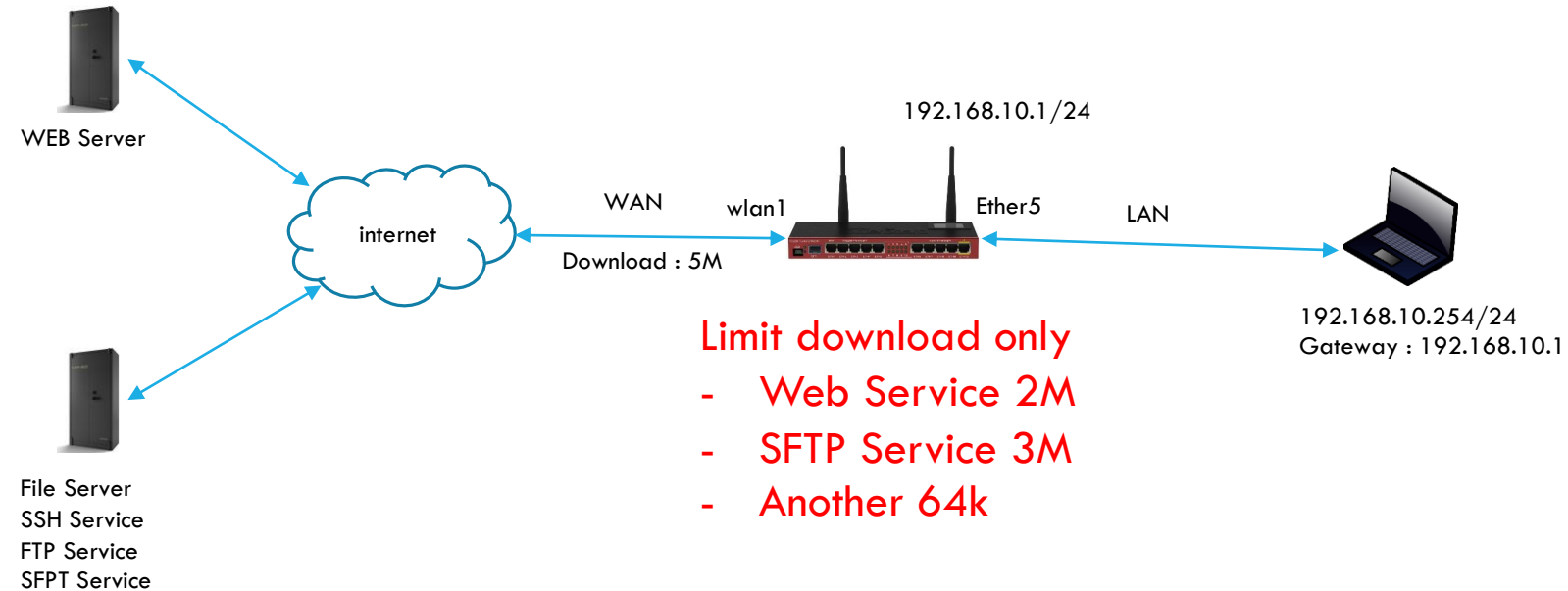
Simple Queues | Interface Queues | Queue Tree | Queue Types

#	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

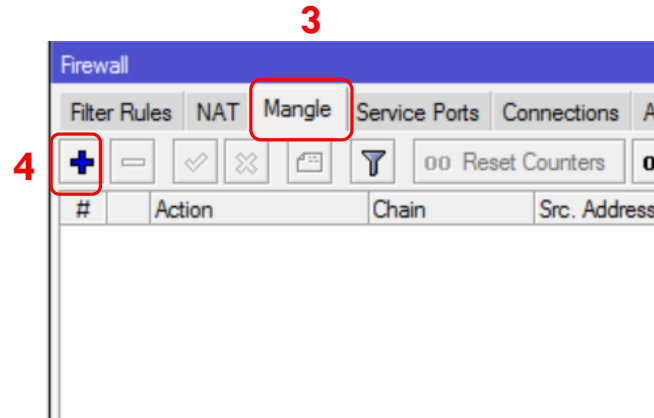
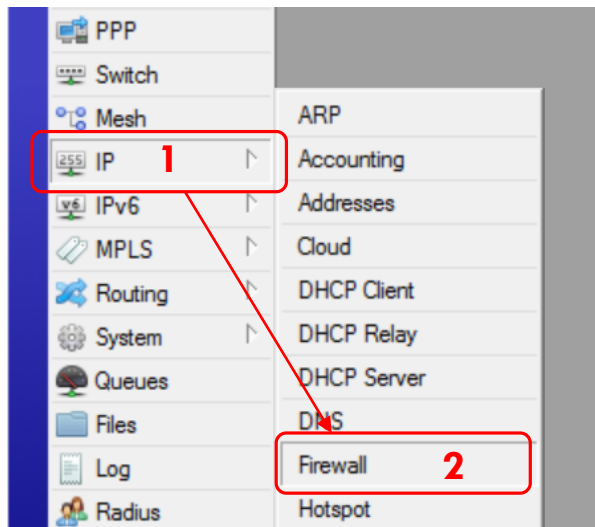
Queue Tree

#	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 shows the configuration of a new Mangle rule in Mikrotik WinBox. The 'General' tab is selected, showing Chain: prerouting, Src. Address: 192.168.10.0/24. A red box highlights the 'General' tab. A red arrow points to the 'Action' tab, which is also highlighted with a red box. The 'Action' tab shows Action: mark connection, Log Prefix: local_conn, and Passthrough checked. A second red arrow points down to the Firewall Rules table.

New Mangle Rule

General | Advanced | Extra | Action | Statistics

Chain: prerouting

Src. Address: 192.168.10.0/24

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

New Mangle Rule

General | Advanced | Extra | Action | Statistics

Action: mark connection

Log Prefix: local_conn

New Connection Mark: local_conn

☒ Passthrough

OK

Cancel

Apply

Disable

Comment

Copy

Firewall

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

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

#	Action	Chain	Src. Address	Dst. Address	F
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

+ - ✓ ✗ [icon] 00 Reset Counters 00 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

+ - ✓ ✗ [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
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

+ - ✓ ✗ [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

+ - ✓ ✗ [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
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

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	
0	mark connection	prerouting	192.168.10.0/24		

Mangle Rule <>

General Advanced Extra Action Statistics

Chain: forward

Src. Address:

Dst. Address:

Protocol: 6 (tcp)

Src. Port: 80,443,8080,22

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

Mangle Rule <>

General Advanced Extra Action Statistics

Action: mark packet

☐ Log

Log Prefix:

New Packet Mark: Other_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												
+ - ✓ ✗ [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	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

+ - ✓ ✗ [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 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

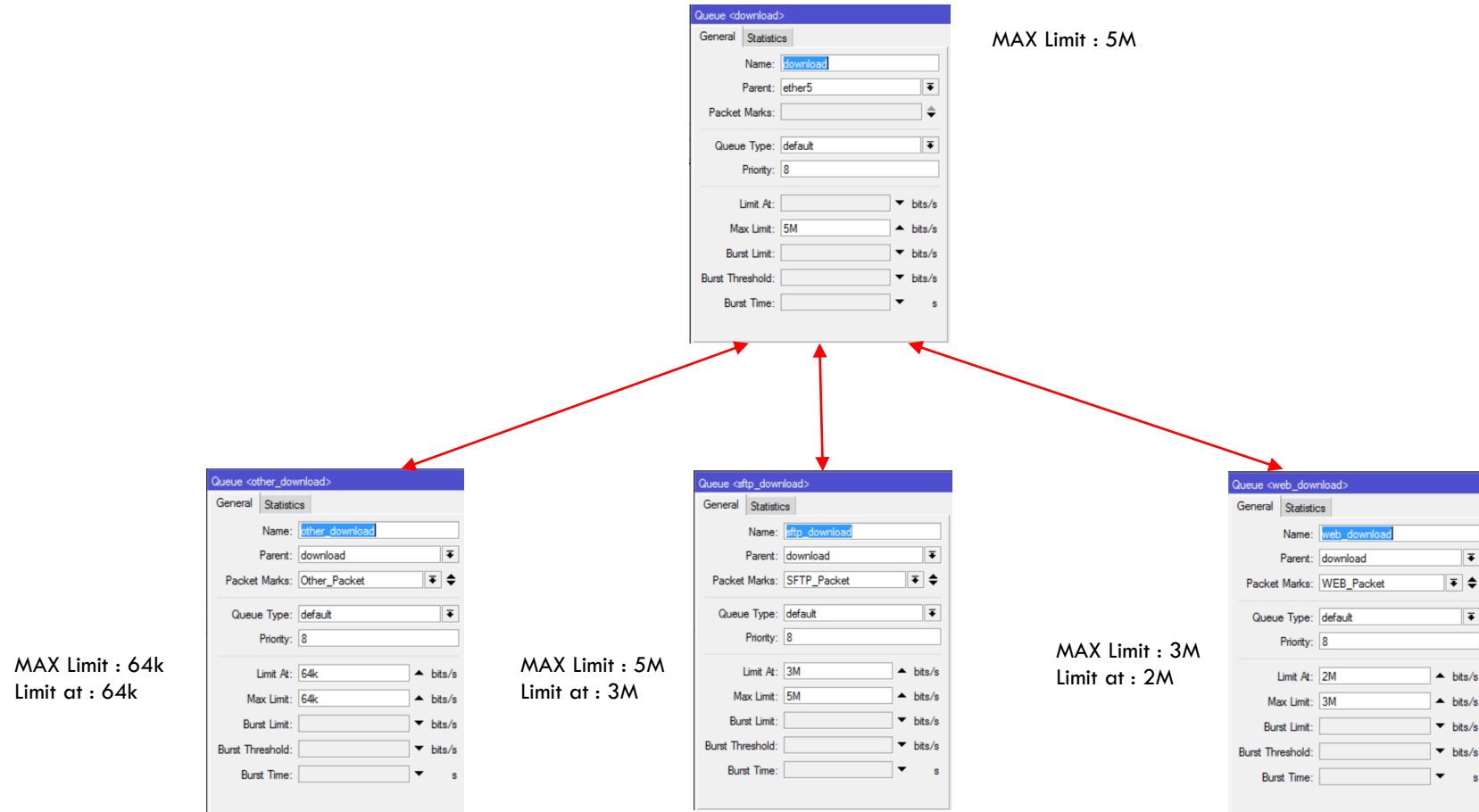
Simple Queues Interface Queues Queue Tree Queue Types

+ - ✓ ✗ [icon] 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



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 screenshot displays the Mikrotik WinBox Queue Configuration interface. At the top, the 'Queue List' window shows a table of configured queues. Below it, three individual queue configuration windows are open, each showing the 'General' tab.

#	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

Simple Queue <limit>

General tab: Name: limit, Target: ether5, Det.: [empty].

Target Upload: Max Limit: 1M, Target Download: 5M bits/s.

Burst: Burst Limit: unlimited, Burst Threshold: unlimited, Burst Time: 0 s.

Simple Queue <another_download>

General tab: Packet Marks: Other_Packet.

Target Upload: Limit At: unlimited, 64k, Priority: 8, Queue Type: default-small, Parent: limit.

Simple Queue <sftp_download>

General tab: Packet Marks: SFTP_Packet.

Target Upload: Limit At: unlimited, 3M, Priority: 8, Queue Type: default-small, Parent: limit.

Simple Queue <web_download>

General tab: Name: web_download, Target: 192.168.10.0/24, Det.: [empty].

Target Upload: Max Limit: unlimited, 3M bits/s.

Burst: Burst Limit: unlimited, Burst Threshold: unlimited, Burst Time: 0 s.

THANKS YOU

Question !!!!!

You can download this document from

<http://mikrotik.kapnetwork.com>