

Optimize Bandwidth For Warnet/SOHO

Created by Andre Kurniawan

> Siapa Kah Saya ??

1. **Nama** : Andre Kurniawan (id hackersmooth88)

2. **Interest in IT** : MikroTik, Hacking and Security, Web SEO, Linux and Windows

3. **Pengalaman:**
 - Kepala Divisi Infrastruktur NOC Maranatha
 - Admin IT Maranatha
 - Trainer Windows Server for Aqua Danone Jawa Barat
 - Sysadmin and Security Analyst di PT Medion
 - Implementation VPN and Migrations OS untuk Bhinneka Group Jawa Barat (Sangkuriang)
 - Sebagai Mikrotik Certified Consultant di Asia
 - Sebagai MikroTik Certified Trainer (PT Netkrom Solusindo)

> PT Netkrom Solusindo



- Tempat : Bandung, Jl Cikutra Baru Raya no 28
- MikroTik Training Partners
- Mengelola SDM IT (IT Training and Project)
- Pengembangan NetMedic untuk Rumah Sakit



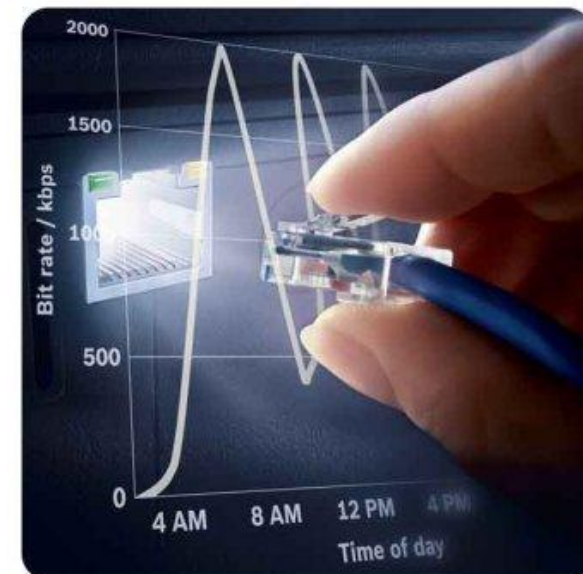
Permasalahan Warnet/SOHO

Created by Andre Kurniawan

> Pembagian Bandwidth

Sering kali di Perusahaan/Warnet sering melakukan :

1. **Pembagian Fix Bandwidth** berdasarkan Network
 - ❖ Misal : 192.168.1.0 (Accounting) upload : 1Mbps , download: 1Mbps
2. Tidak ada pengontrolan terhadap **Port**
3. **No Priority**
4. Pengelompokan IP Internet secara general



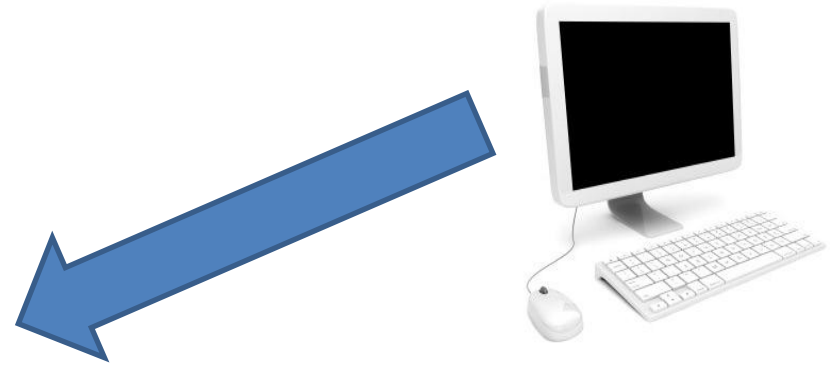
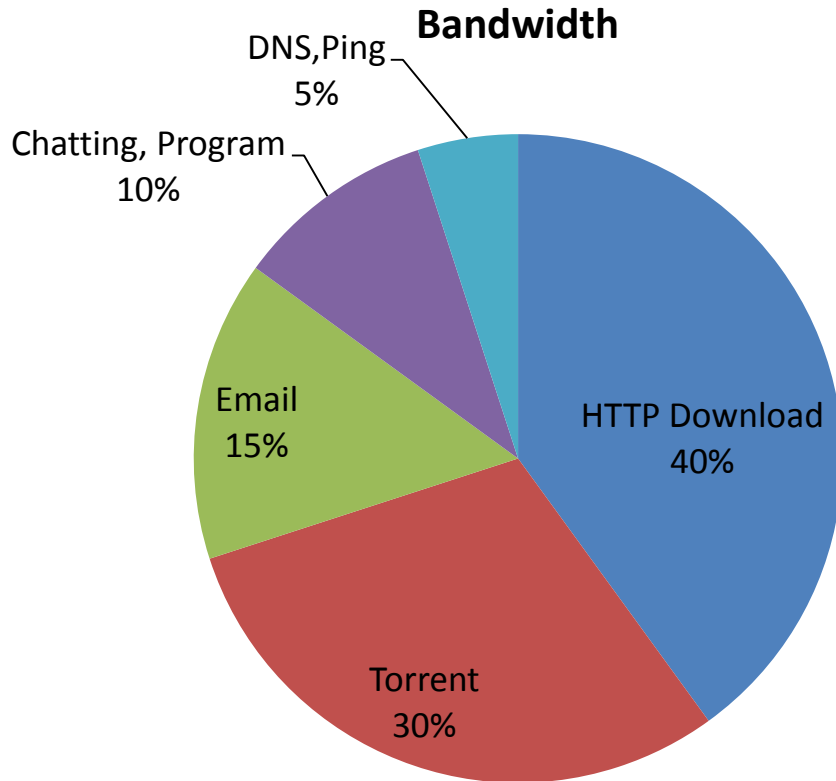
> BIG PROBLEM !!!



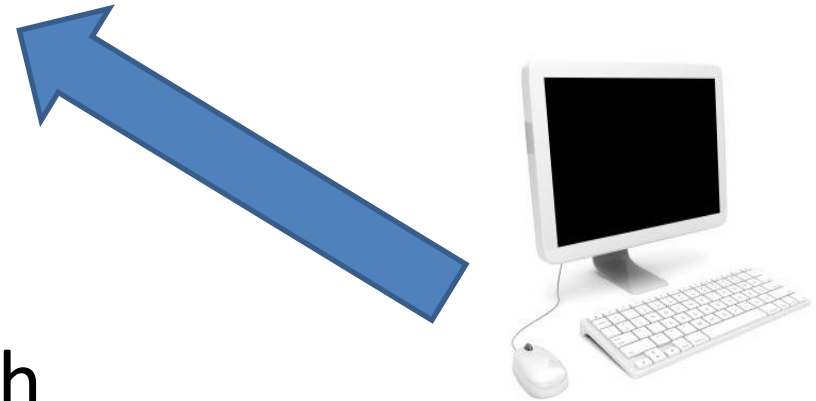
Direktur / Manager Marah
karena Aplikasi Lambat

Saling menyalahkan antar Divisi
/ Sesama Admin

> BIG PROBLEM !!!



Accounting



IT

Saling berebut bandwidth

> Solusi Terbaik *MikroTik*

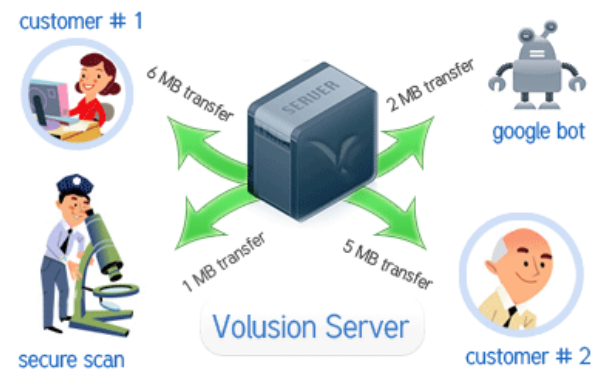
1. Atur penggunaan segment menggunakan **teknik PCQ**

- ❖ Dinamis Bandwidth
- ❖ Mencegah Bandwidth terbuang dengan percuma

2. Gunakan teknik Control Packet dengan **Mark Packet dan Mark Connection**

- ❖ Packet Games
- ❖ Packet Browsing
- ❖ Packet Torrent
- ❖ Packet ICMP dan DNS

Bandwidth Usage Diagram



total bandwidth usage: 14 MB

3. Buatlah tabel melakukan **Priority** terhadap Program Penting

4. Koneksi Jalur dengan 2 Line ISP (**Mark Routing**)

Case Topologi

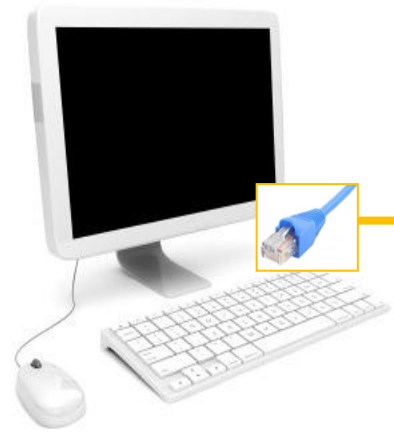
Created by Andre Kurniawan

> TOPOLOGI DASAR

Area Server
192.168.200.0/24



Router ETH2
192.168.200.1



Router ETH1
192.168.1.1



PC/Laptop
192.168.1.2

Router WLAN1
10.10.10.2



WLAN1 ISP
10.10.10.1



ISP A



Internet



Pembagian Bandwidth via Port

Created by Andre Kurniawan

> Packet Marking

1. Gunakan “ **connection-mark**” untuk meng-klasifikasi koneksi dari client yang akan kita kontrol
2. Kemudian gunakan “ **packet-mark** “ untuk meng-klasifikasi semua traffic yang berada dari connection Mark

Connection-Mark → Packet Mark

*Lakukan Grouping Pada Packet Marking dengan Fitur Jump

> Grouping Chain untuk games

Mangle Rule <>

General Advanced Extra Action Statistics

Chain: prerouting

Src. Address:

Dst. Address:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

P2P:

In. Interface:

Out. Interface:

Packet Mark:

Connection Mark:

Melakukan pengelompokan chain yang 1 jenis

Mangle Rule <>

General Advanced Extra Action Statistics

Action: jump

Jump Target: Games

> Connection Marking

Mangle Rule <1818>

General Advanced Extra Action Statistics

Chain: Games

Src. Address:

Dst. Address:

Protocol: 6 (tcp)

Src. Port:

Dst. Port: 1818

Any. Port:

P2P:

Mangle Rule <1818>

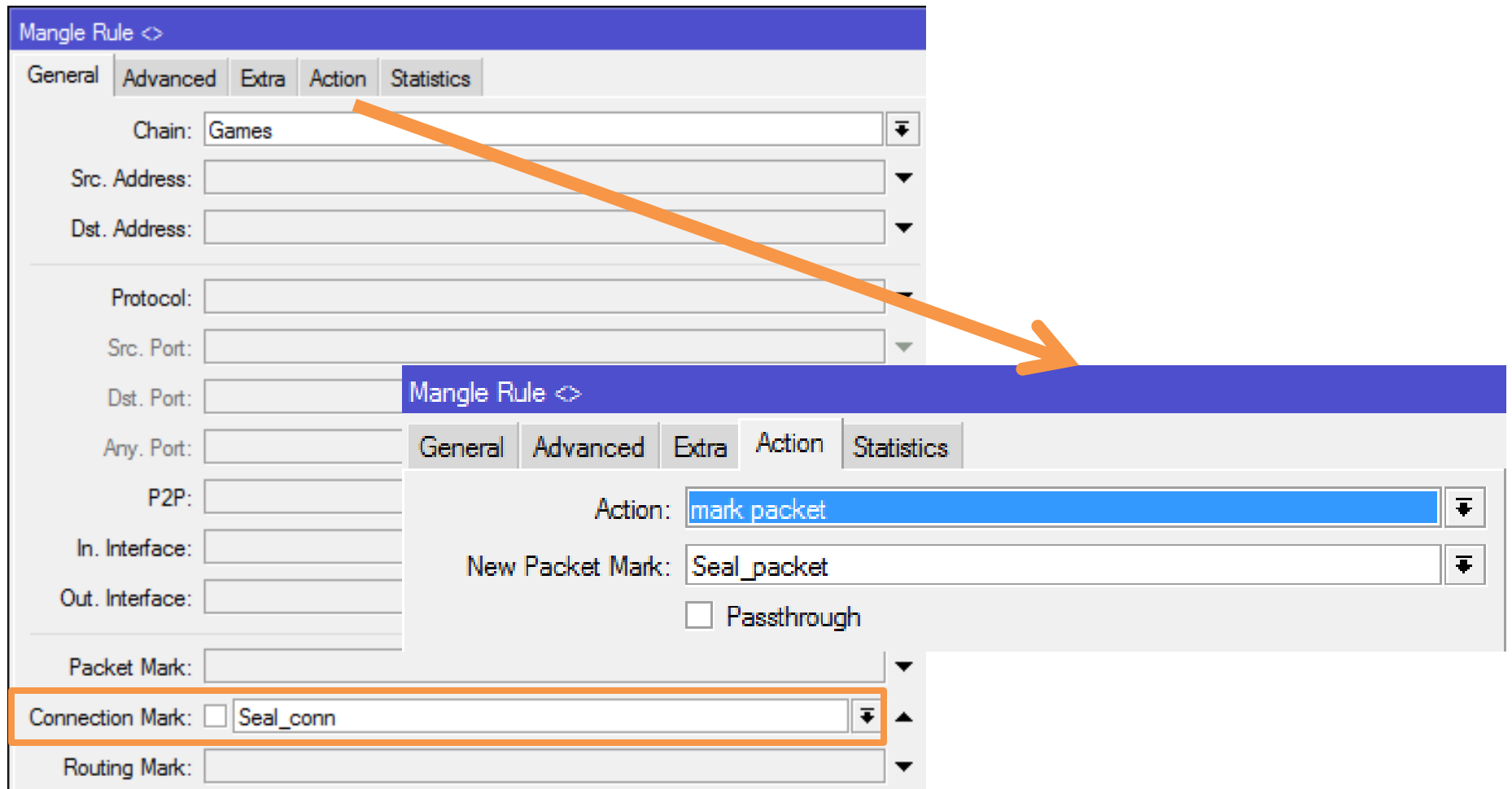
General Advanced Extra Action Statistics

Action: mark connection

New Connection Mark: Seal_conn

Passthrough

> Packet Marking



The screenshot displays the Mikrotik WinBox interface for configuring a Mangle Rule. The 'Action' tab is selected, showing the following configuration:

- Chain: Games
- Src. Address: [Empty]
- Dst. Address: [Empty]
- Protocol: [Empty]
- Src. Port: [Empty]
- Dst. Port: [Empty]
- Any. Port: [Empty]
- P2P: [Empty]
- In. Interface: [Empty]
- Out. Interface: [Empty]
- Packet Mark: [Empty]
- Connection Mark: Seal_conn
- Routing Mark: [Empty]

The 'Action' section is expanded to show:

- Action: mark packet
- New Packet Mark: Seal_packet
- Passthrough

An orange arrow points from the 'Chain' dropdown to the 'Action' dropdown. The 'Connection Mark' field is highlighted with an orange border.

> Table Packet Marking (Mangle)

Games

Nama Aplikasi	Jenis Koneksi	Port	Jenis Chain
PointBlank	UDP	40000-40010	Prerouting
Ayo Dance	TCP	18900-18910	Prerouting
Seal Online	TCP	1818	Prerouting
Lineage2	TCP	7777	prerouting
Ghost Online	TCP	19101	Prerouting
DOTA	TCP	6000-6125	prerouting
Drift City	TCP	11011-11041	prerouting
3 Kingdoms	TCP	15000-15002	Prerouting
Poker	TCP	9339	Prerouting (connection-state=new)

Browsing

Nama	Koneksi	Port	Jenis Chain
Browsing	TCP	80	forward

> Table Packet Marking (Mangle)

Koneksi Server Utility

Nama Aplikasi	Jenis Koneksi	Port	Jenis Chain
ping	ICMP	-	Forward
dns	UDP	53	forward

Peer – To - Peer

Nama	Koneksi	Port	Jenis Chain
All Torrent	all-p2p		forward

Lakukan pembuatan Packet Marking dengan cara yang sama
(Slide sebelum nya)

> Table Packet Marking (Mangle)

Contoh Script Terminal

-- GAMES

```
/ip firewall mangle add action=jump chain=prerouting disabled=no jump-target=Games  
add action=mark-connection chain=Games comment="Aplikasi Dota" disabled=no \  
dst-port=6000-6125 new-connection-mark=Dota_conn passthrough=yes \  
protocol=tcp  
add action=mark-packet chain=Games connection-mark=Dota_conn disabled=no \  
new-packet-mark=Dota_packet passthrough=no
```




















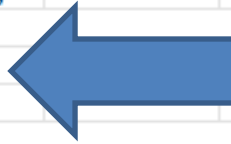



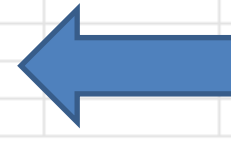





-- Browsing

```
add action=mark-connection chain=forward comment="Packet Browsing" disabled=\  
no dst-port=80 new-connection-mark=Browse_conn passthrough=yes protocol=\  
tcp  
add action=mark-packet chain=forward connection-mark=Browse_conn disabled=no \  
new-packet-mark=Browse_Packet passthrough=no
```

-- ICMP

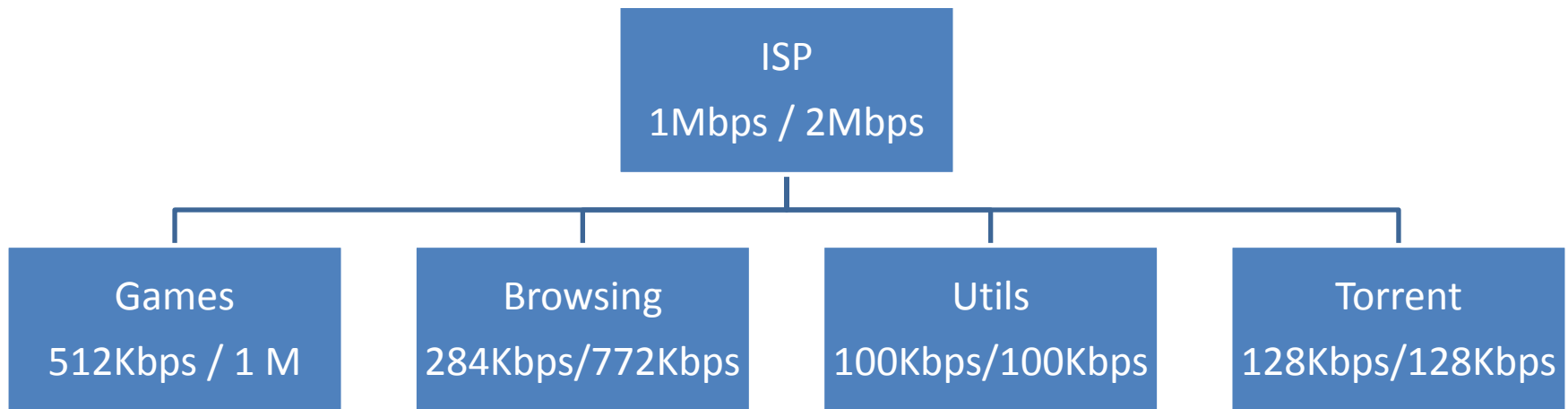
```
add action=mark-connection chain=forward disabled=no new-connection-mark=\  
icmp_conn passthrough=yes protocol=icmp  
add action=mark-packet chain=forward connection-mark=icmp_conn disabled=no \  
new-packet-mark=icmp_packet passthrough=no
```

> Table Packet Marking (Mangle)

Firewall								
Filter Rules NAT Mangle Service Ports Connections Address Lists Layer7 Protocols								
       Reset Counters  Reset All Counters								
#	Action	Chain	Src. Address	Dst. Address	Protocol	Src. Port	Dst. Port	
::: Aplikasi Point Blank								
0	 mark connection	Games			17 (udp)		40000-40010	
1	 mark packet	Games						
::: Aplikasi Ayo Dance								
2	 mark connection	Games			6 (tcp)		18900-18910	 1
3	 mark packet	Games						
::: Aplikasi Seal Online								
4	 mark connection	Games			6 (tcp)		1818	
5	 mark packet	Games						
::: Aplikasi Dota								
6	 mark connection	Games			6 (tcp)		6000-6125	
7	 mark packet	Games						
8	 jump	prerouting						
::: Packet Browsing								
9	 mark connection	forward			6 (tcp)		80	 2
10	 mark packet	forward						
::: Packet ICMP dan DNS								
11	 mark connection	forward			17 (udp)		53	
12	 mark packet	forward						 3
13	 mark connection	forward			1 (icmp)			
14	 mark packet	forward						
::: Packet untuk All Torrent								
15	 mark connection	forward						 4
16	 mark packet	forward						

> Mapping Bandwidth

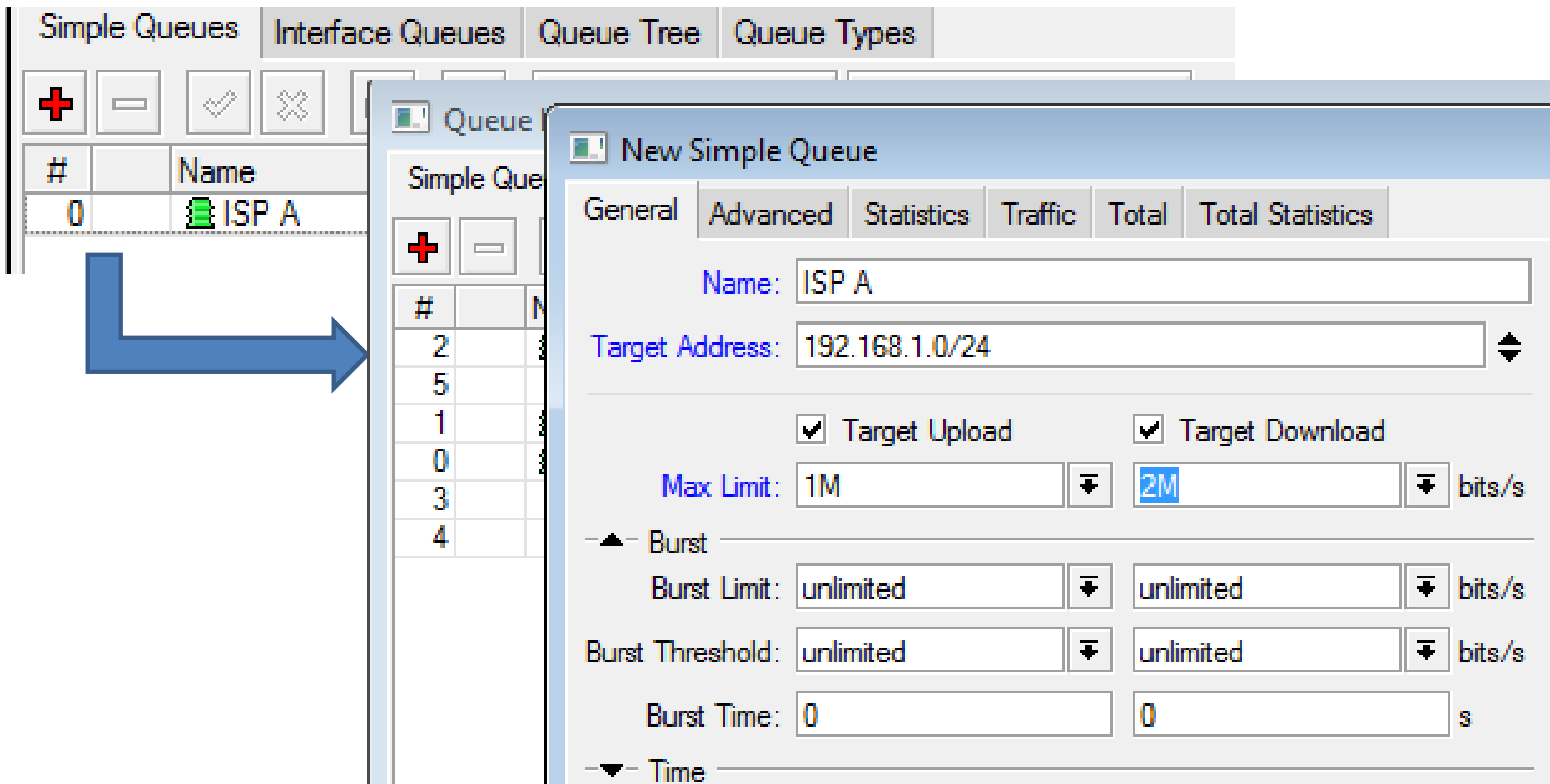
Setelah melakukan Packet Marking , langkah selanjutnya adalah memetakan keseluruhan Bandwidth Upload dan Download dari ISP



**Dengan melakukan pembagian,
Aplikasi yang sedang berjalan tidak saling tarik-menarik**

> Simple Queues

Lakukan Pengaturan Bandwidth Network Anda berdasarkan kebutuhan port / aplikasi



The screenshot shows the Mikrotik WinBox interface for configuring Simple Queues. The 'Simple Queues' tab is active, displaying a table with one entry: #0, Name: ISP A. A blue arrow points from this entry to the 'New Simple Queue' dialog box.

Simple Queues Table:

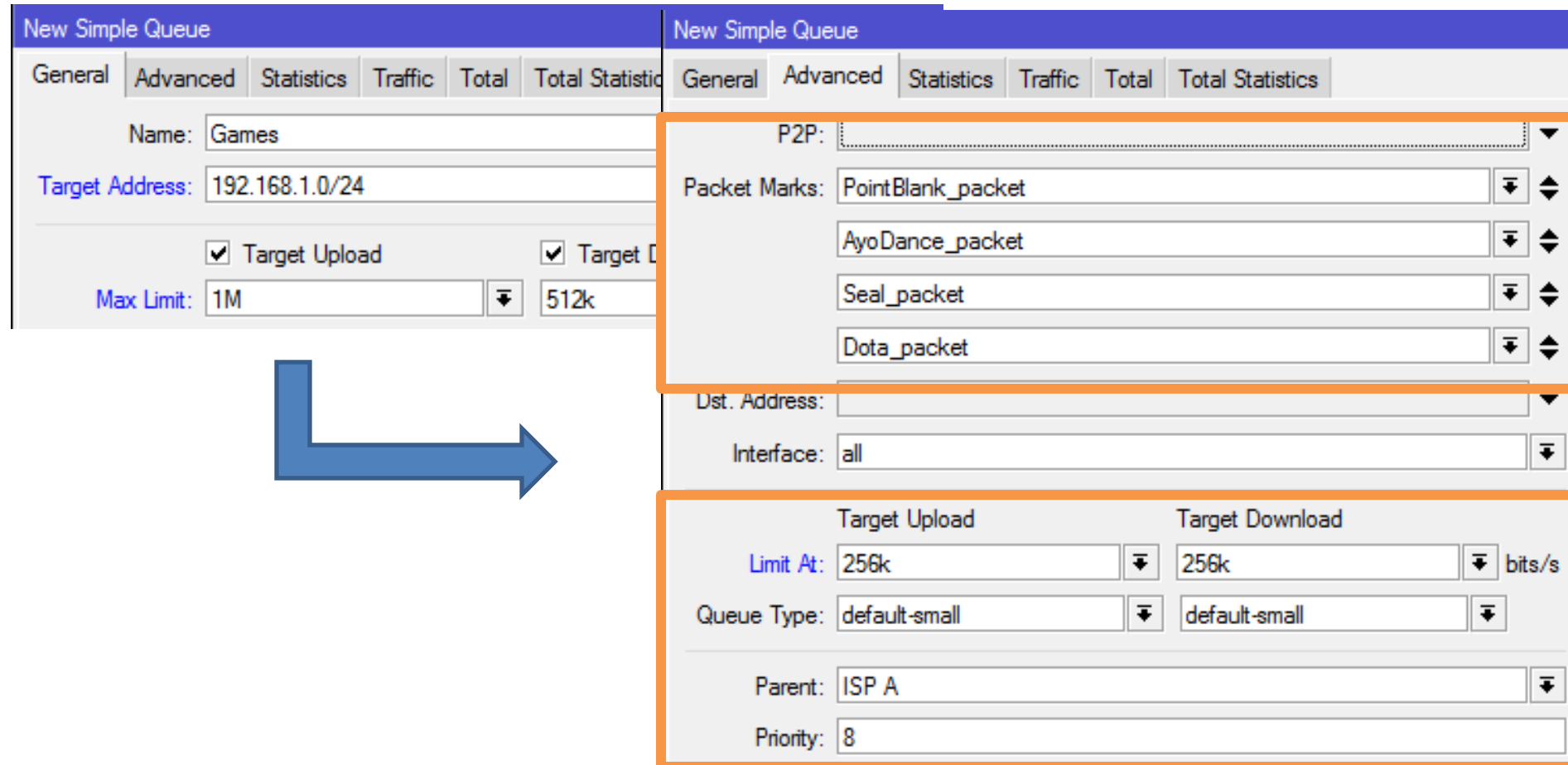
#	Name
0	ISP A

New Simple Queue Dialog:

- General tab selected
- Name: ISP A
- Target Address: 192.168.1.0/24
- Target Upload
- Target Download
- Max Limit: 1M (Upload) / 2M (Download) bits/s
- Burst Limit: unlimited (Upload) / unlimited (Download) bits/s
- Burst Threshold: unlimited (Upload) / unlimited (Download) bits/s
- Burst Time: 0 s

> Simple Queues

Lakukan Pengaturan Bandwidth Network Anda berdasarkan kebutuhan port / aplikasi



New Simple Queue

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

Name: Games

Target Address: 192.168.1.0/24

Target Upload Target Download

Max Limit: 1M 512k

New Simple Queue

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

P2P: [Dropdown]

Packet Marks: PointBlank_packet
AyoDance_packet
Seal_packet
Dota_packet

Dst. Address: [Dropdown]

Interface: all

Target Upload	Target Download
Limit At: 256k	256k bits/s
Queue Type: default-small	default-small









Parent: ISP A

Priority: 8

> Mapping Bandwidth

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types







 Reset Counters
  Reset All Counters

#	Name	Target Address	Rx Max Li...	Tx Max Limit	Packet Marks
0	ISP A		1M	2M	
3	Utils	192.168.1.0/24	100k	100k	dns_packet, icmp_packet
4	Torrent	192.168.1.0/24	128k	128k	p2p_packet
2	Browsing	192.168.1.0/24	284k	772k	Browse_Packet
1	Games	192.168.1.0/24	1M	512k	PointBlank_packet, AyoDanc...

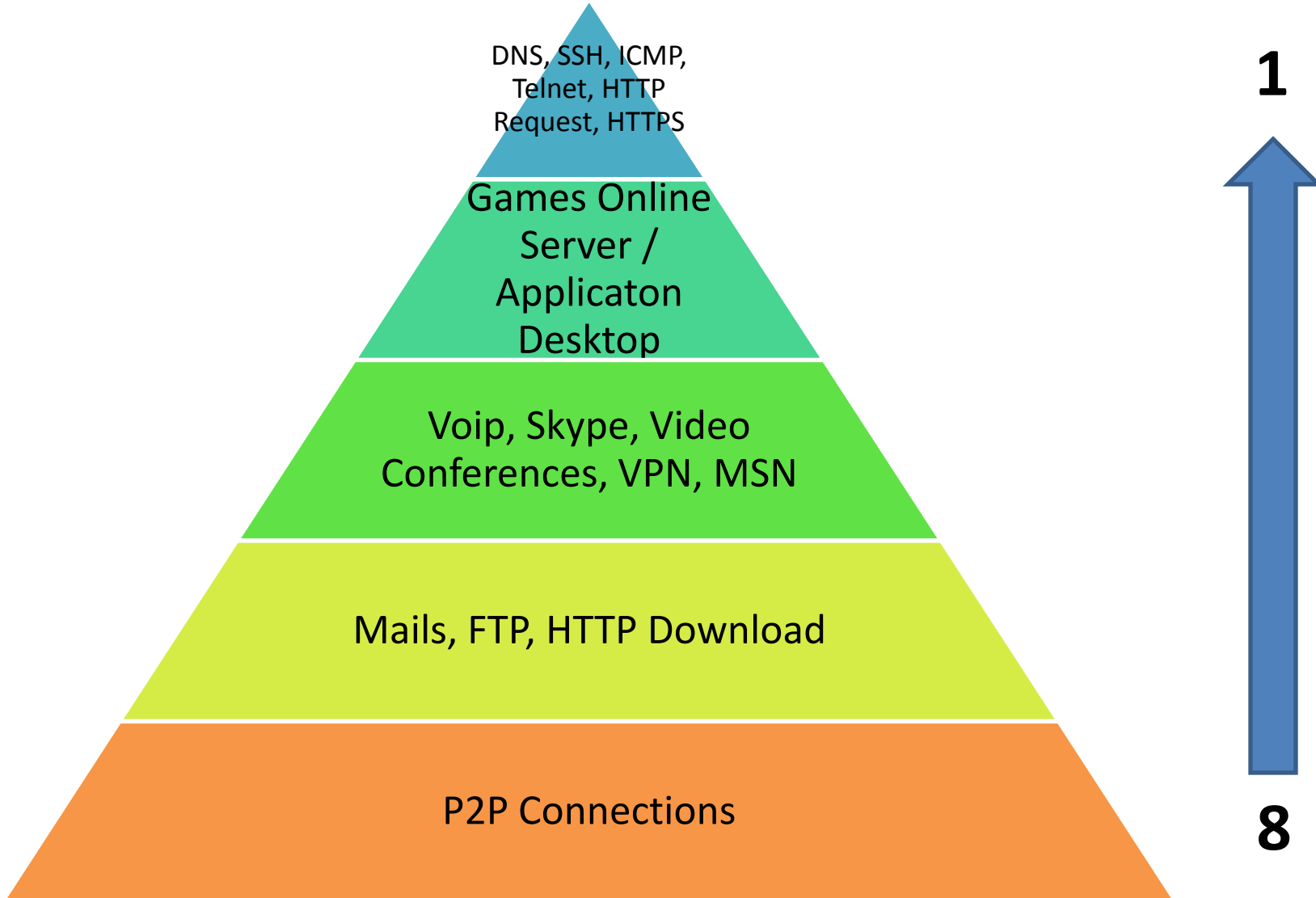
**Dengan melakukan pembagian,
Aplikasi yang sedang berjalan tidak saling tarik-menarik**



Pengaturan Prioritas

Created by Andre Kurniawan

> Prioritas Plan



> Prioritas Plan

Simple Queue <Games>

General Advanced Statistics Traffic Total Total Statistics

P2P:

Packet Marks:

Dst. Address:

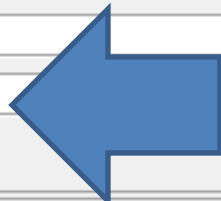
Interface:

Target Upload Target Download

Limit At: bits/s

Queue Type:

Parent:

Priority: 

enabled

> Thank You

Andre Kurniawan

PT Netkrom Solusindo

Jl Cikutra Baru Raya no 28, Bandung

Tlp : 085720372244

Emai : andre@netkromsolution.com

PIN : 25F12B9D

Facebook: www.facebook.com/netkromsolution