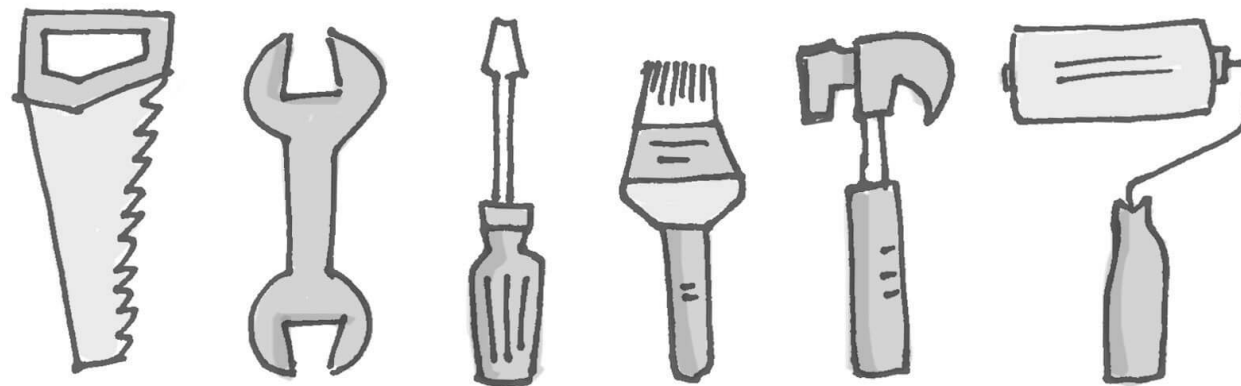


MikroTik

RouterOS Tools

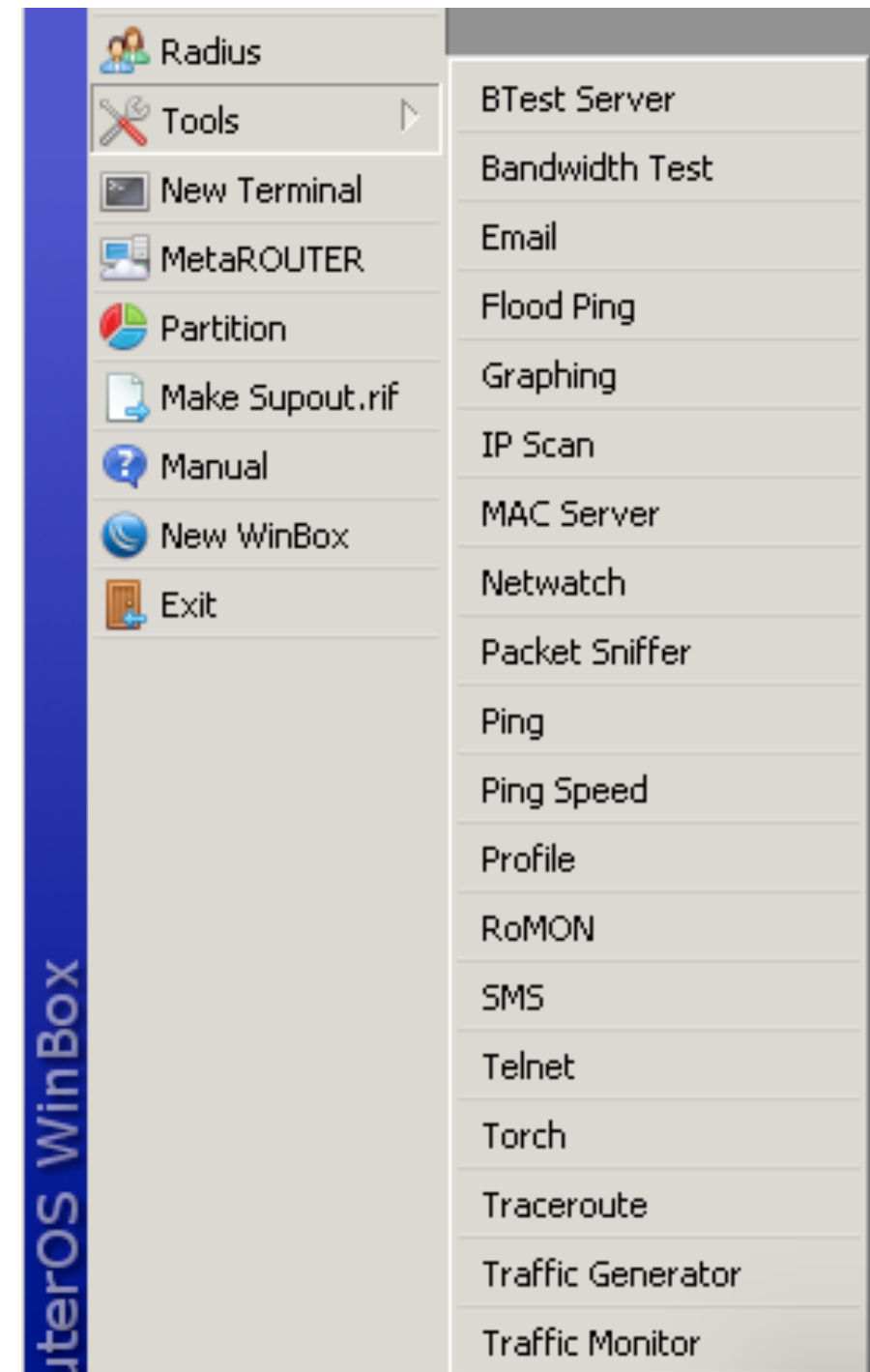


About Me

- **Name: Chan Ty**
- **Experience: Routing, Switching and QoS**
- **Certified to deliver: MTCNA, MTCRE, MTCINE and MTCTCE**

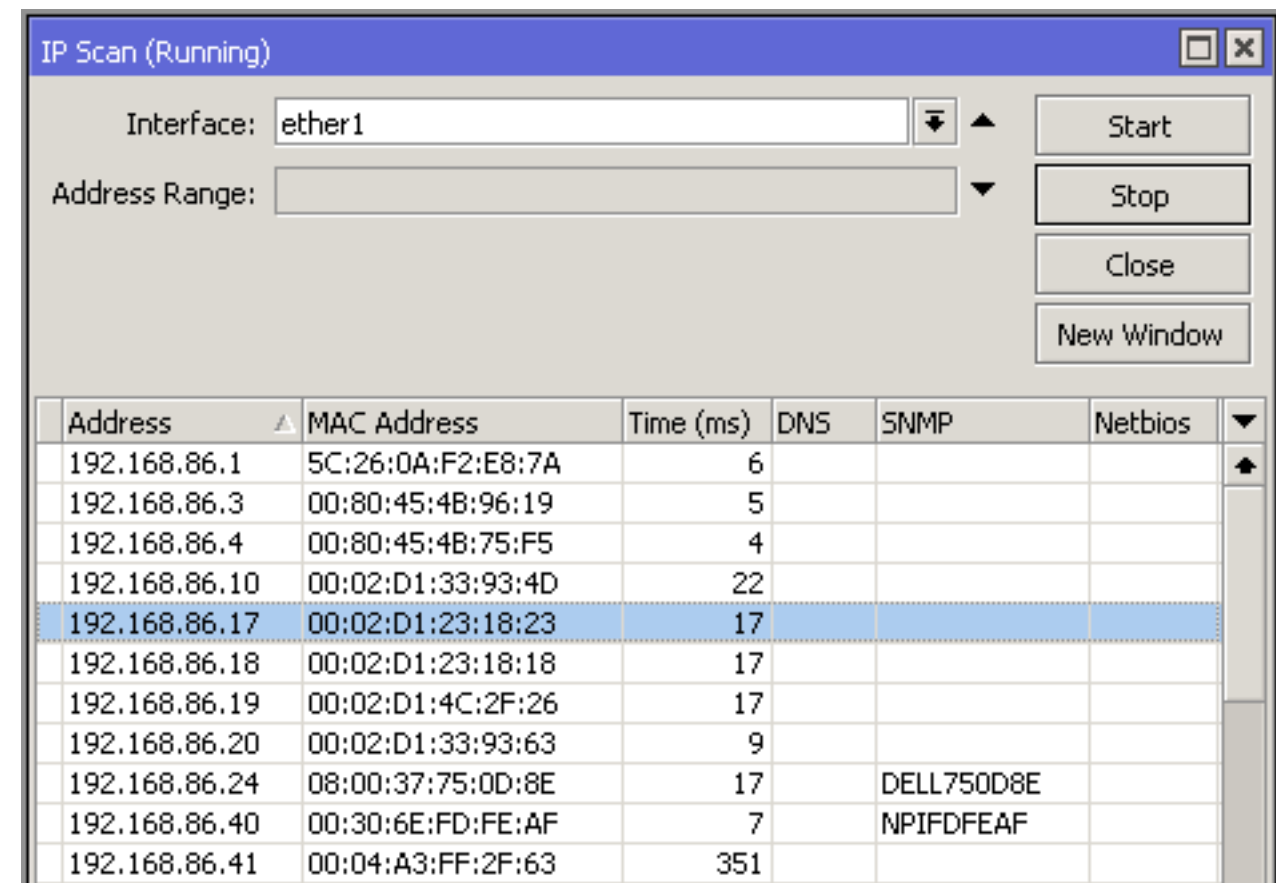
Agenda

- I am going to present some usual tools that is available in RouterOS
- Most of them are under **Tools** menu



IP Scan

- IP Scan tool allows user to scan network based on some network prefix or by setting interface to listen to
- Either way tool collects data from the network



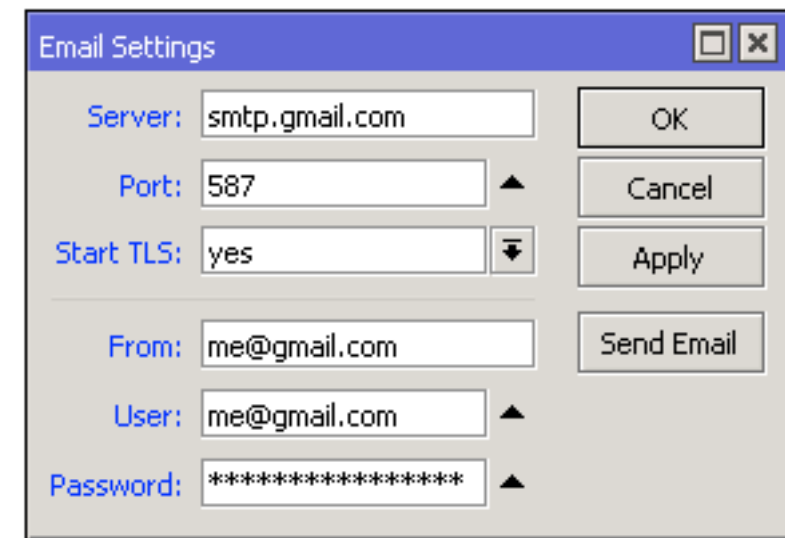
The screenshot shows the 'IP Scan (Running)' window. It has a title bar with standard window controls. Below the title bar, there are two input fields: 'Interface:' with 'ether1' selected and 'Address Range:' which is empty. To the right of these fields are four buttons: 'Start', 'Stop', 'Close', and 'New Window'. Below the input fields is a table with the following data:

Address	MAC Address	Time (ms)	DNS	SNMP	Netbios
192.168.86.1	5C:26:0A:F2:E8:7A	6			
192.168.86.3	00:80:45:4B:96:19	5			
192.168.86.4	00:80:45:4B:75:F5	4			
192.168.86.10	00:02:D1:33:93:4D	22			
192.168.86.17	00:02:D1:23:18:23	17			
192.168.86.18	00:02:D1:23:18:18	17			
192.168.86.19	00:02:D1:4C:2F:26	17			
192.168.86.20	00:02:D1:33:93:63	9			
192.168.86.24	08:00:37:75:0D:8E	17		DELL750D8E	
192.168.86.40	00:30:6E:FD:FE:AF	7		NPIFDFEAF	
192.168.86.41	00:04:A3:FF:2F:63	351			

Tools → IP Scan

E-mail

- Allows to send e-mails from the router
- For example to send router backup

A screenshot of a 'Email Settings' dialog box. It contains several input fields: 'Server' with 'smtp.gmail.com', 'Port' with '587', 'Start TLS' with 'yes', 'From' with 'me@gmail.com', 'User' with 'me@gmail.com', and 'Password' with a masked password '*****'. On the right side, there are four buttons: 'OK', 'Cancel', 'Apply', and 'Send Email'.

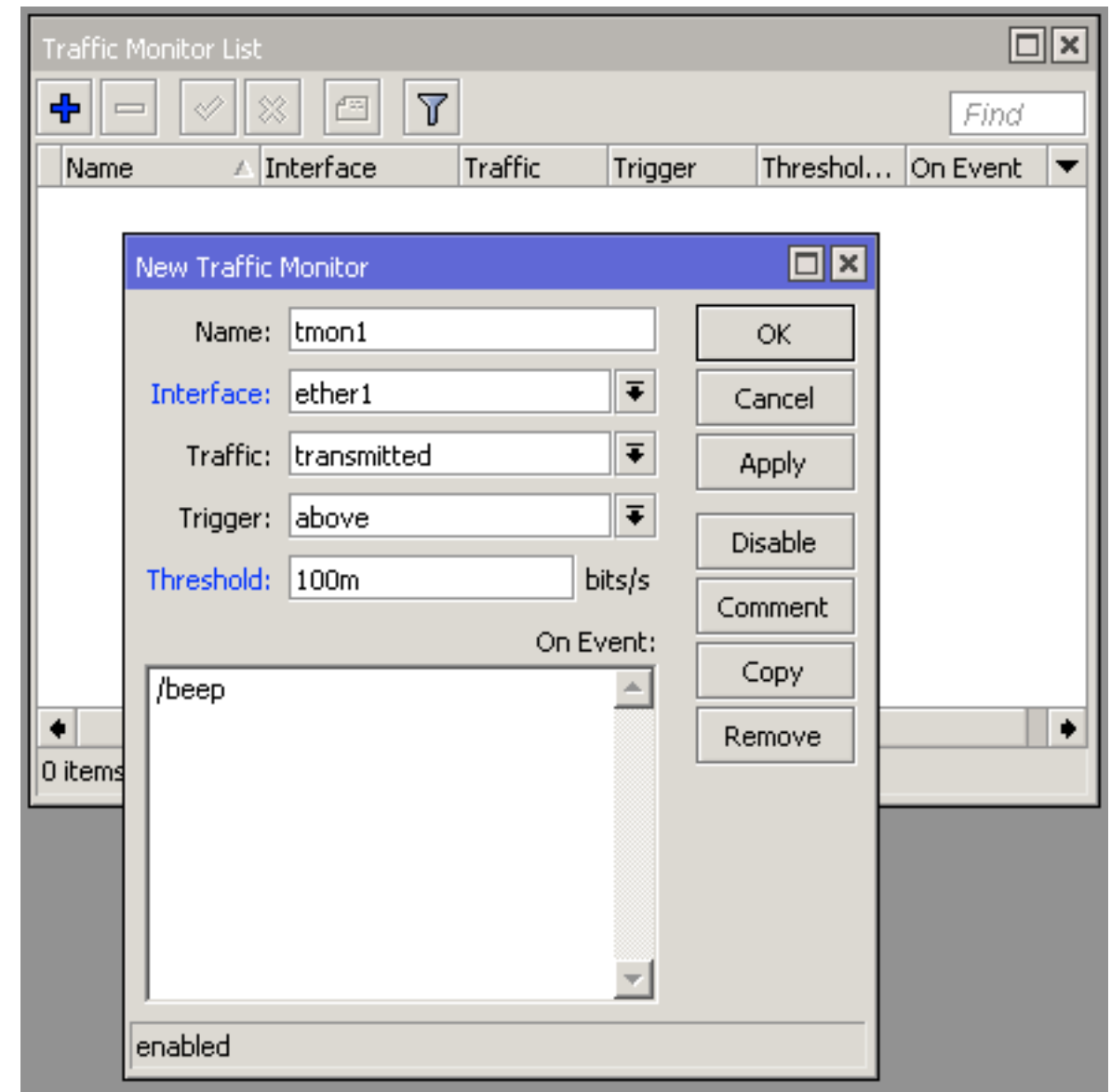
Tools → Email

```
/export file=export
/tool e-mail send to=you@gmail.com\
  subject="$[/system identity get name] export"\
  body="$[/system clock get date]\
  configuration file" file=export.rsc
```

A script to make an export file and send it via e-mail

Traffic Monitor

- Traffic Monitor tool is used to execute console script when interface traffic crosses a given threshold



Tools → Traffic Monitor

Profiler

- Profiler tool show CPU usage for each process running in RouterOS
- It helps to identify which process is using most of the CPU resources

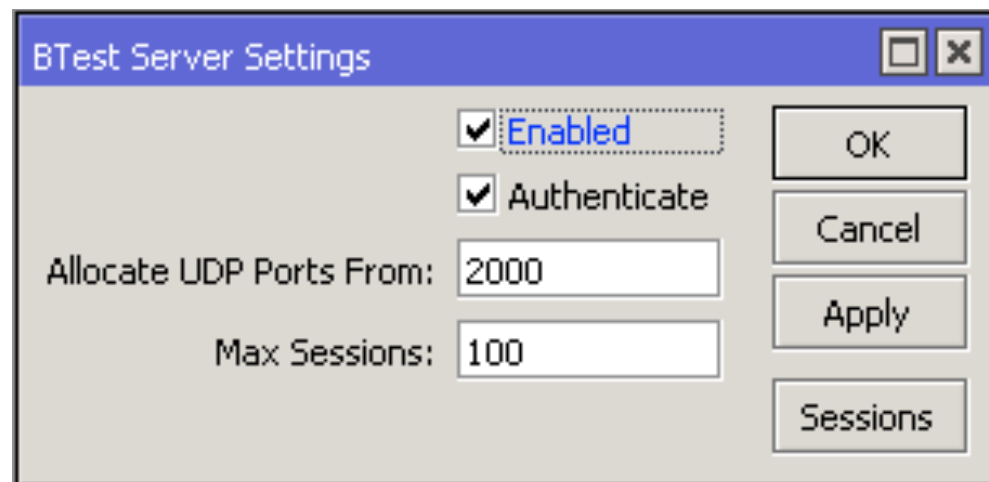
Name	CPU	Usage
cpu1		6.5
cpu0		5.5
networking	0	3.5
firewall	1	3.5
networking	1	0.5
firewall	0	1.5
ethernet	1	1.5
ethernet	0	0.5
dns	1	0.5
queuing	1	0.5
management	0	0.0
dns	0	0.0
mpls	0	0.0
pptp	0	0.0
queuing	0	0.0
routing	0	0.0
management	1	0.0
mpls	1	0.0
routing	1	0.0

19 items

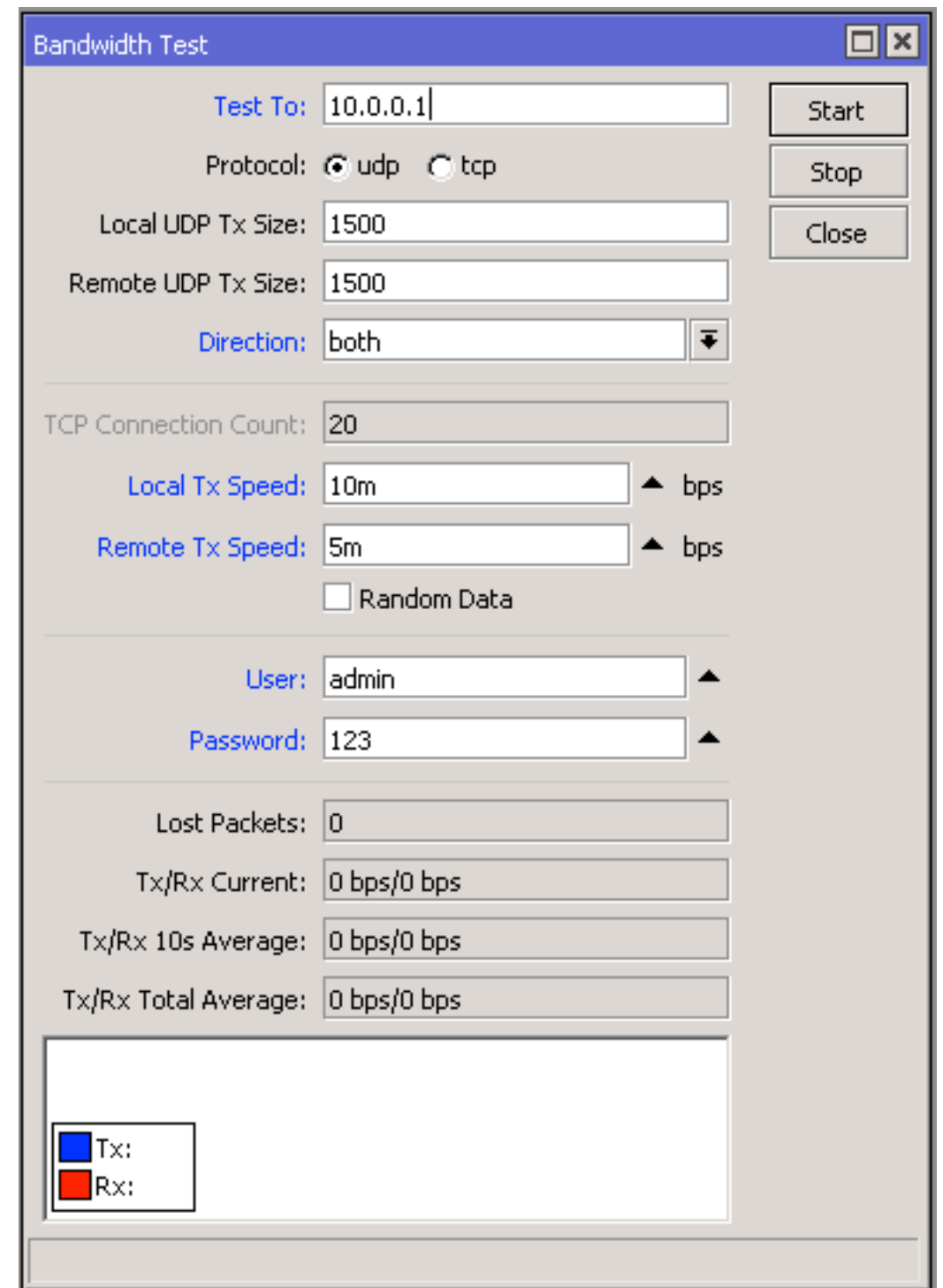
Tools → Profiles

Bandwidth Test

- The Bandwidth Tester can be used to measure the throughput to another MikroTik router and thereby help to discover network bottlenecks
- Support both TCP and UDP



Tools → BTest Server



Tools → Bandwidth Test

Bandwidth Test

admin@192.168.88.1 (MikroTik) - WinBox v6.22 on RB1200 (powerpc)

Safe Mode

Hide Passwords

Quick Set
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
Partition
Make Supout.tif
Manual
Exit

Address List

Address	Network	Interface
10.1.1.254/24	10.1.1.0	ether6
10.10.10.254/24	10.10.10.0	ether5
10.10.10.254	10.10.10.2	<pppoe-epmp>
10.10.20.254/24	10.10.20.0	ether5
10.120		
192.16		

Interface List

Interface <ether6>

General	Ethernet	Status	Traffic
Tx/Rx Rate: 557.4 kbps / 25.5 Mbps			
Tx/Rx Packet Rate: 1 056 p/s / 2 110 p/s			
Tx/Rx Bytes: 654.9 GiB / 24.3 GiB			
Tx/Rx Packets: 466 978 053 / 237 465 342			
Tx/Rx Drops: 7 / 0			
Tx/Rx Errors: 0 / 0			

8 ite

enabled running slave

enabled running slave link ok

Bandwidth Test (Running)

Test To: 10.1.1.100

Protocol: ☐ udp ☒ tcp

Local UDP Tx Size: 1500

Remote UDP Tx Size: 1500

Direction: receive

TCP Connection Count: 1

Local Tx Speed: bps

Remote Tx Speed: bps

☒ Random Data

User: admin

Password:

Lost Packets: 0

Tx/Rx Current: 0 bps/24.2 Mbps

Tx/Rx 10s Average: 0 bps/24.2 Mbps

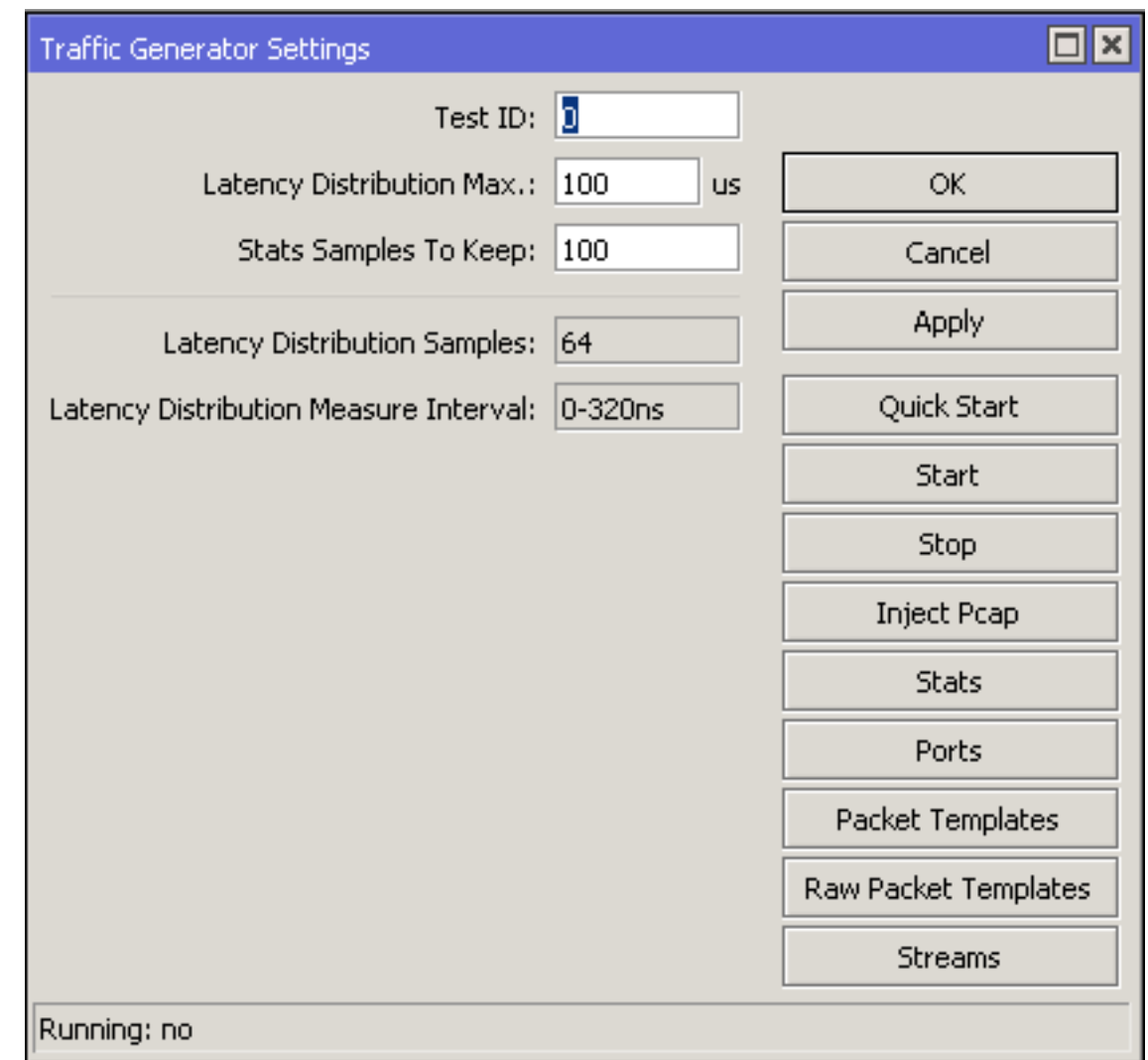
Tx/Rx Total Average: 0 bps/24.2 Mbps

running...

RouterOS WinBox

Traffic Generator

- Traffic Generator is a tool that allows to evaluate performance of DUT (Device Under Test)
- Tool can generate and send RAW packets over specific port

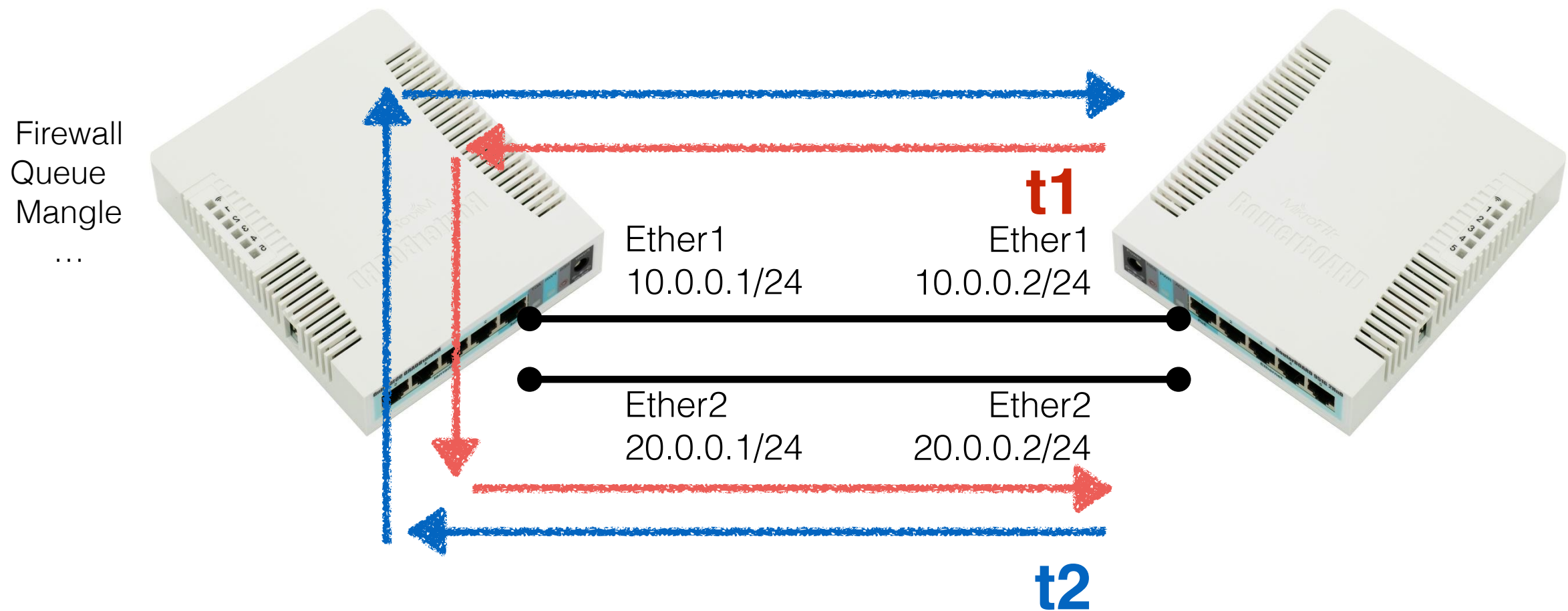


Tools → Traffic Generator

Traffic Generator

DUT

Traffic Generator



Traffic Generator

- Traffic Generator Configuration

```
/tool traffic-generator packet-template  
add header-stack=mac,ip,upd ip-dst=20.0.0.2 ip-gateway=10.0.0.1 name=t1  
add header-stack=mac,ip,upd ip-dst=10.0.0.2 ip-gateway=20.0.0.1 name=t2
```

A script to make an T1 and T2 packet template

```
[admin@MikroTik] > tool traffic-generator quick tx-template=t1,t2 packet-size=60 mbps=10
```

SEQ	ID	TX-PACKET	TX-RATE	RX-PACKET	RX-RATE	RX-000	LOST-PACKET	LOST-RATE	LAT-MIN	LAT-AVG	LAT-MAX	JITTER
9	1	20 834	10.0Mbps	20 834	10.0Mbps	0	0	0bps	26.5us	82.7us	392us	366us
9	TOT	41 669	20.0Mbps	41 669	20.0Mbps	0	0	0bps	24.7us	72.6us	392us	367us
10	0	20 331	9.7Mbps	20 331	9.7Mbps	0	0	0bps	24.6us	49.3us	245us	221us
10	1	20 332	9.7Mbps	20 332	9.7Mbps	0	0	0bps	25.5us	60.2us	298us	272us
10	TOT	40 663	19.5Mbps	40 663	19.5Mbps	0	0	0bps	24.6us	54.7us	298us	273us
11	0	21 335	10.2Mbps	21 335	10.2Mbps	0	0	0bps	24.3us	49.8us	256us	232us
11	1	21 335	10.2Mbps	21 335	10.2Mbps	0	0	0bps	26.3us	61.1us	335us	309us
11	TOT	42 670	20.4Mbps	42 670	20.4Mbps	0	0	0bps	24.3us	55.5us	335us	311us

A command to generate T1 and T2 traffic

Traffic Generator

- Device Under Test (DUT)

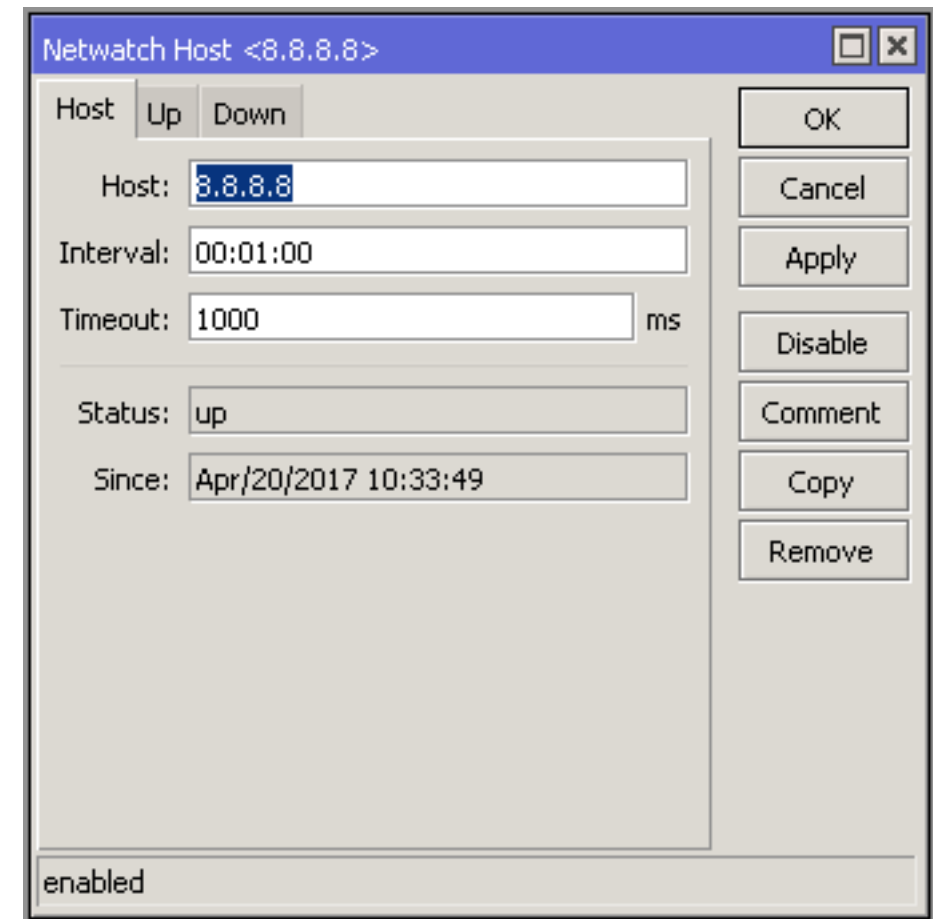
```
admin@MikroTik] > interface monitor-traffic aggregate,ether1,ether2
```

	name:	ether1-gateway	ether2-master-local
rx-packets-per-second:	42 026	21 000	21 002
rx-drops-per-second:	0	0	0
rx-errors-per-second:	0	0	0
rx-bits-per-second:	21.5Mbps	10.7Mbps	10.7Mbps
tx-packets-per-second:	42 023	21 000	20 999
tx-drops-per-second:	0	0	0
tx-errors-per-second:	0	0	0
tx-bits-per-second:	21.5Mbps	10.7Mbps	10.7Mbps

A command to see traffic statistic on Aggregate, Ether1 and Ether2

Netwatch

- Monitor state of hosts on the network
- Send ICMP echo request (ping)
- Can execute a script when a host becomes unreachable or reachable

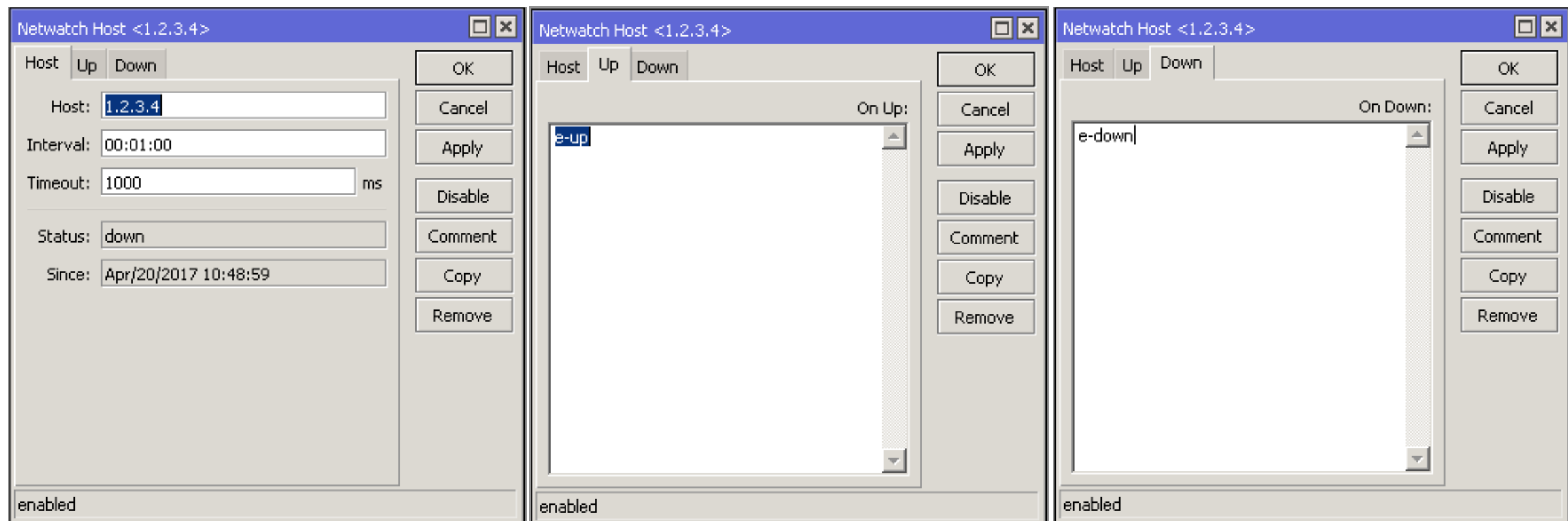


Tools → Netwatch

Netwatch

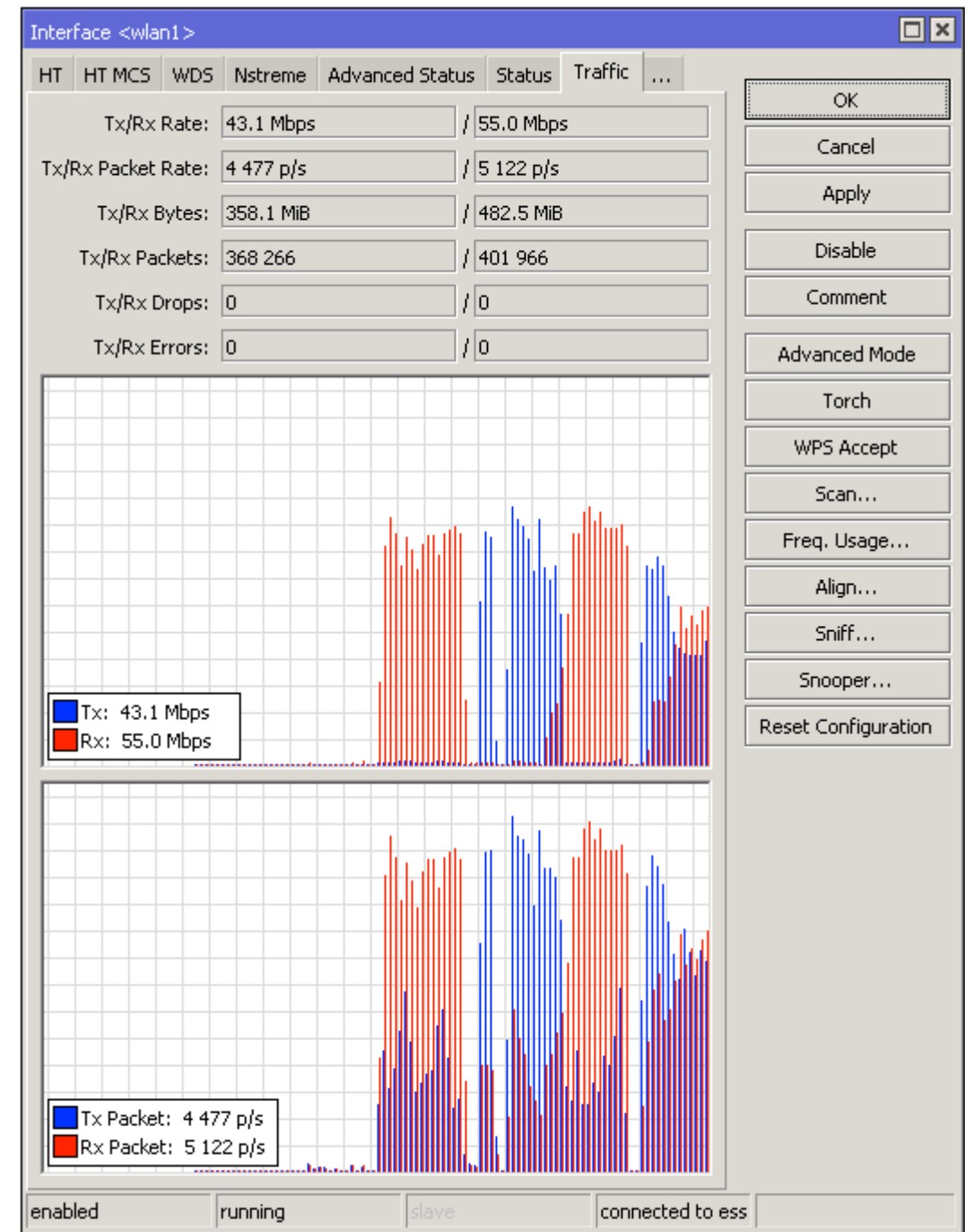
```
/system script add name=e-down source="/tool e-mail send  
from=router1@example.com server=smtp.example.com body="Your Internet line  
1 is down" to=helpdesk@example.com"
```

```
/system script add name=e-up source="/tool e-mail send  
from=router1@example.com server=smtp.example.com body="Your Internet line  
1 is up" to=helpdesk@example.com"
```



Interface Traffic Monitor

- Real time traffic status
- Available for each interface in traffic tab
- Can also be accessed from both WebFig and command line interface



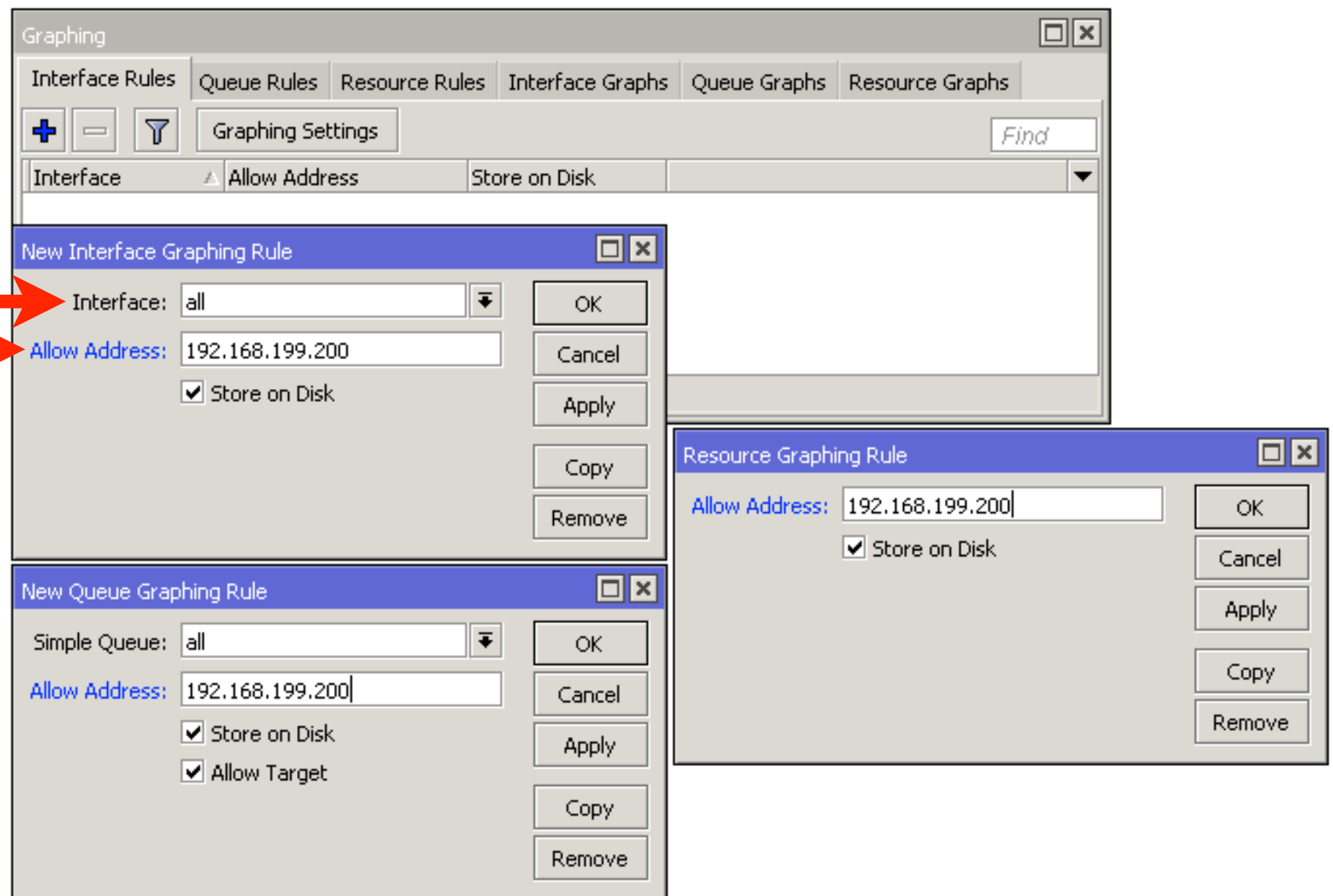
Interfaces → wlan1 → Traffic

Graphing

- RouterOS can generate graphs showing how much traffic has passed through an interface or a queue
- Can show CPU, memory and disk usage
- For each metric there are 4 graphs - daily, weekly, monthly and yearly

Graphing

Set specific interface to monitor or leave all, set IP address/subnet which will be able to access the graphs



Tools → Graphing

Graphing

Traffic and system resource graphing

[CPU usage](#)

[Memory usage](#)

[Disk usage](#)

You have access to 4 queues:

[129](#)

[130](#)

[131](#)

[parent](#)

You have access to 7 interfaces:

[ether1-gateway](#)

[ether2-master-local](#)

[ether3-slave-local](#)

[ether4-slave-local](#)

[ether5](#)

[wlan1](#)

[bridge-local](#)

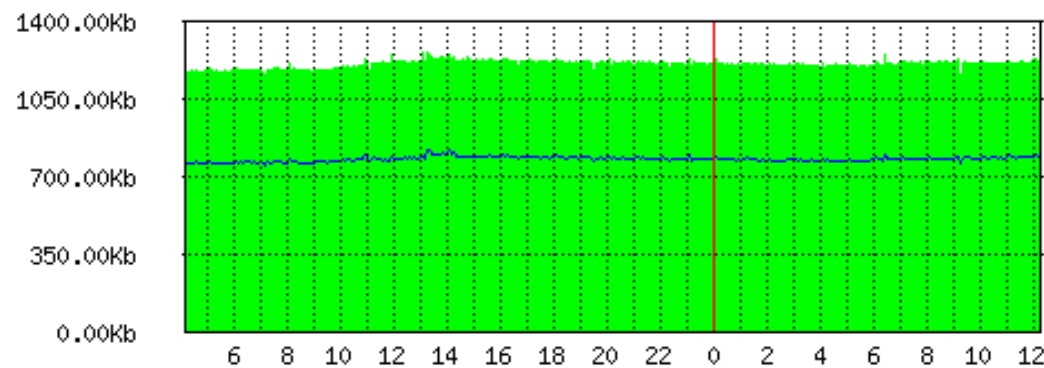
- Available on the router: **http://router_ip/graphs**

Graphing

Interface <ether1-gateway> Statistics

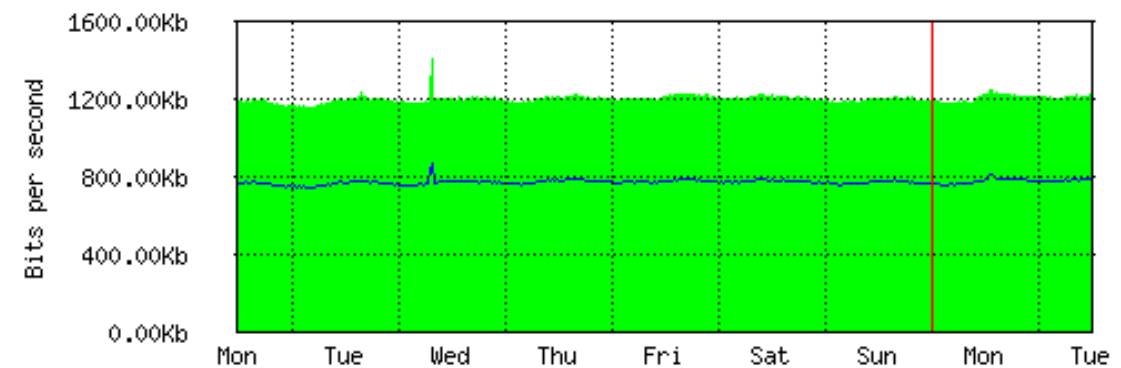
• Last update: Wed Dec 31 23:59:59 2015

"Daily" Graph (5 Minute Average)



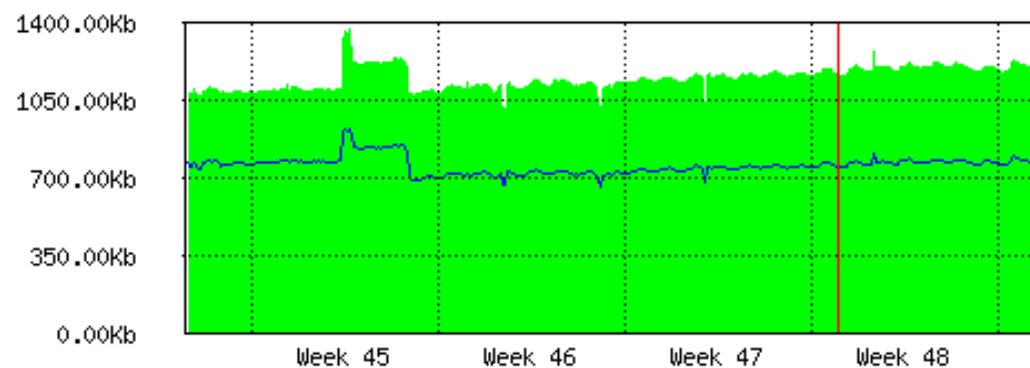
Max In: 1.26Mb; Average In: 1.21Mb; Current In: 1.22Mb;
Max Out: 821.58Kb; Average Out: 780.56Kb; Current Out: 793.75Kb;

"Weekly" Graph (30 Minute Average)



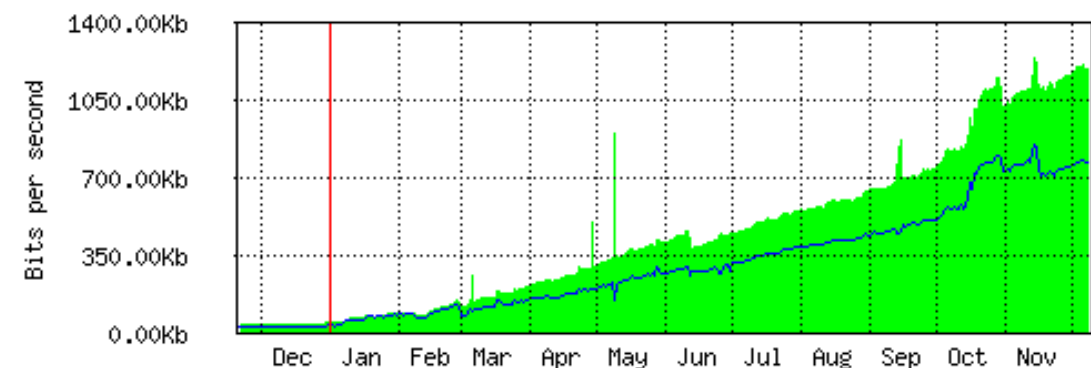
Max In: 1.41Mb; Average In: 1.20Mb; Current In: 1.22Mb;
Max Out: 872.20Kb; Average Out: 772.71Kb; Current Out: 792.54Kb;

"Monthly" Graph (2 Hour Average)



Max In: 1.37Mb; Average In: 1.15Mb; Current In: 1.21Mb;
Max Out: 922.93Kb; Average Out: 757.19Kb; Current Out: 786.12Kb;

"Yearly" Graph (1 Day Average)



Max In: 1.24Mb; Average In: 445.51Kb; Current In: 1.20Mb;
Max Out: 850.52Kb; Average Out: 303.36Kb; Current Out: 772.42Kb;

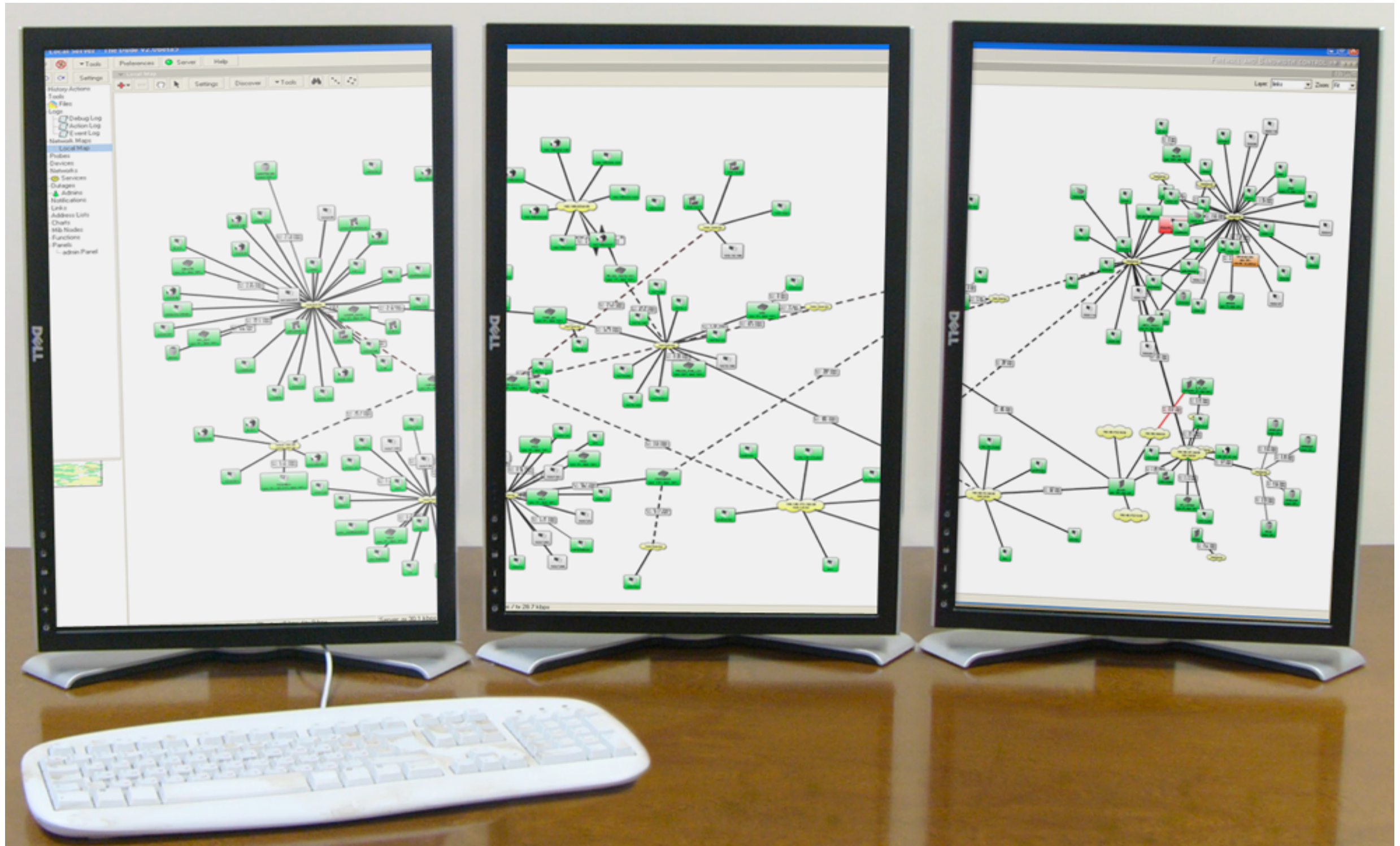
The Dude

- Application by MikroTik which can dramatically improve the way you manage your network environment
- Automatic discovery and layout map of devices
- Monitoring of services and alerting
- Free of charge

The Dude

- Support SNMP, ICMP, DNS and TCP monitoring
- Server part run on RouterOS (CCR, CHR, or x86)
- Client on Windows (works on Linux and OS X using Wine)

The Dude



Torch

- Real-time monitoring tool
- Can be used to monitor the traffic flow through the interface
- Can monitor traffic classified by IP protocol name, source/destination address (IPv4/IPv6), port number

Torch

The screenshot shows the Torch (Running) window with the following configuration:

- Basic:** Interface: bridge-local, Entry Timeout: 00:00:03 s
- Collect:** ☒ Src. Address, ☐ Src. Address6, ☒ Dst. Address, ☐ Dst. Address6, ☐ MAC Protocol, ☒ Port, ☐ VLAN Id, ☐ DSCP
- Filters:** Src. Address: 192.168.199.200, Dst. Address: 159.148.147.196, Src. Address6: ::/0, Dst. Address6: ::/0, MAC Protocol: all, Protocol: tcp, Port: https, VLAN Id: any, DSCP: any

Buttons: Start, Stop, Close, New Window

Eth. Protocol	Protocol	Src.	Dst.	Tx Rate	Rx Rate	Tx Packet Rate	Rx Packet Rate
800 (ip)	6 (tcp)	192.168.199.200:58658	159.148.147.196:443 (https)	757.3 kbps	54.9 kbps	68	52
800 (ip)	6 (tcp)	192.168.199.200:58656	159.148.147.196:443 (https)	303.5 kbps	51.1 kbps	28	27
800 (ip)	6 (tcp)	192.168.199.200:58659	159.148.147.196:443 (https)	296.5 kbps	40.9 kbps	29	26
800 (ip)	6 (tcp)	192.168.199.200:58655	159.148.147.196:443 (https)	171.4 kbps	54.0 kbps	22	23
800 (ip)	6 (tcp)	192.168.199.200:58661	159.148.147.196:443 (https)	63.2 kbps	22.5 kbps	6	8
800 (ip)	6 (tcp)	192.168.199.200:58662	159.148.147.196:443 (https)	47.7 kbps	22.4 kbps	6	8
800 (ip)	6 (tcp)	192.168.199.200:58657	159.148.147.196:443 (https)	0 bps	0 bps	0	0

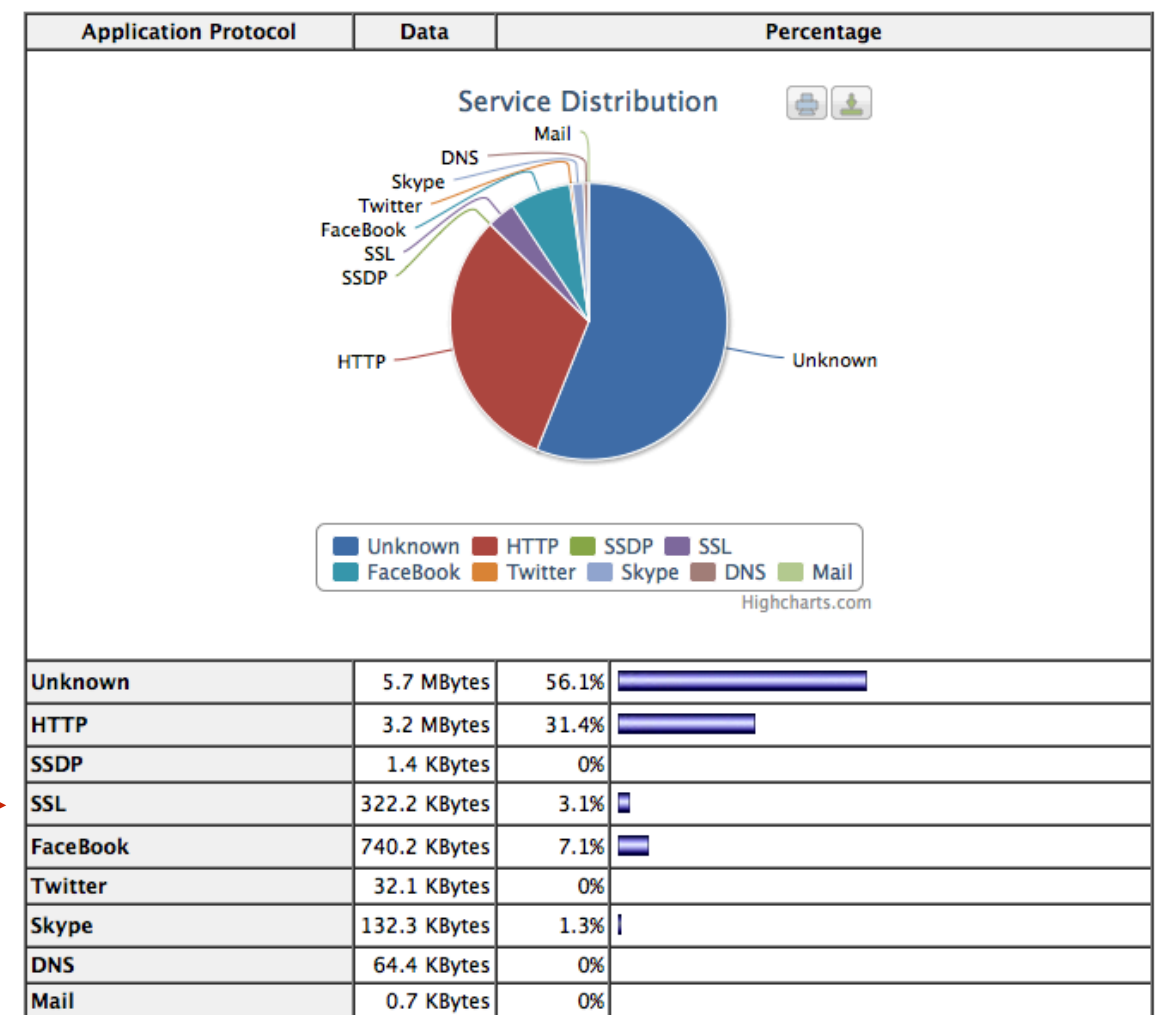
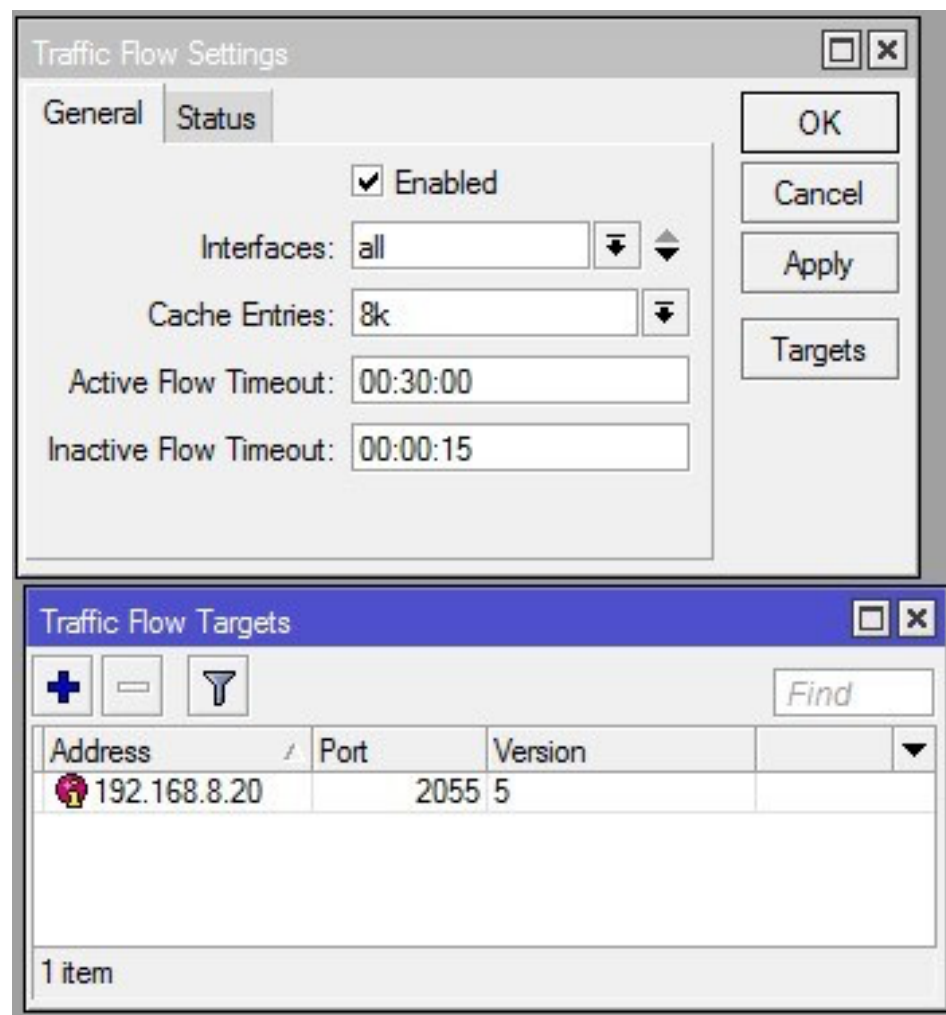
7 items | Total Tx: 1639.8 kbps | Total Rx: 245.9 kbps | Total Tx Packet: 159 | Total Rx Packet: 144

Tools → Torch

- Traffic flow from the laptop to the mikrotik.com web server HTTPS port

Traffic Flow

- Traffic Flow is a system that provides statistic information about packets which pass through the router



Tools → Traffic Flow

www.ntop.org

That is it!!

Or Khun
(Thanks)

