Custom Internet Connection Checker for Indonesian ISP Customer

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MUM ID - 2020

Bio

Iwan Chandra

MikroTik Certified Trainer (since 2015)

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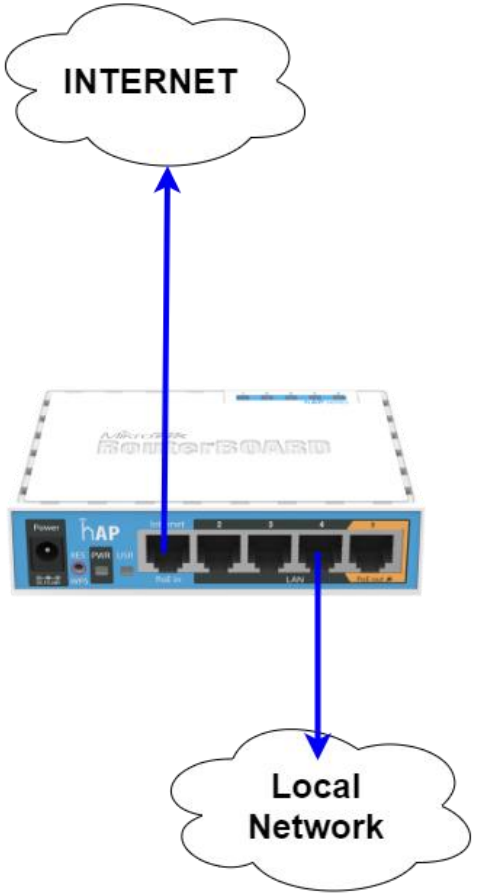
Trainer at BelajarMikroTik.COM

Lecture at Institut Sains Terpadu dan Teknologi Surabaya

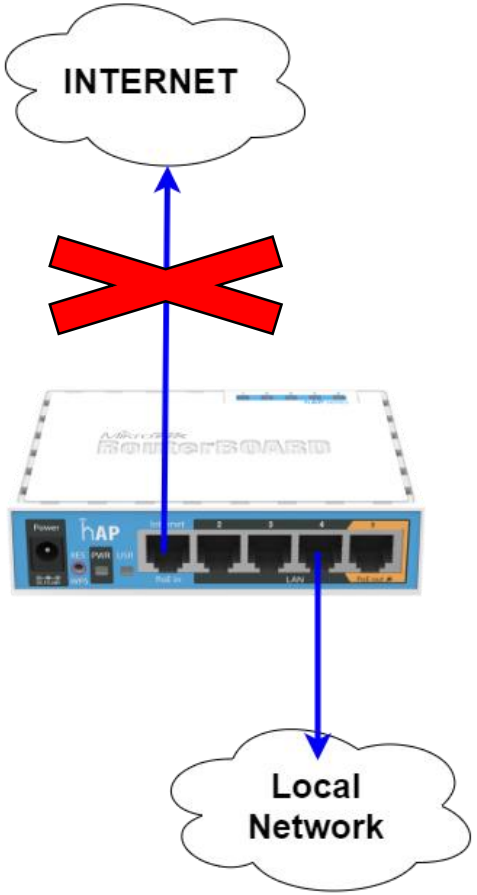
Runner and Triathlete

Typical End User Topology



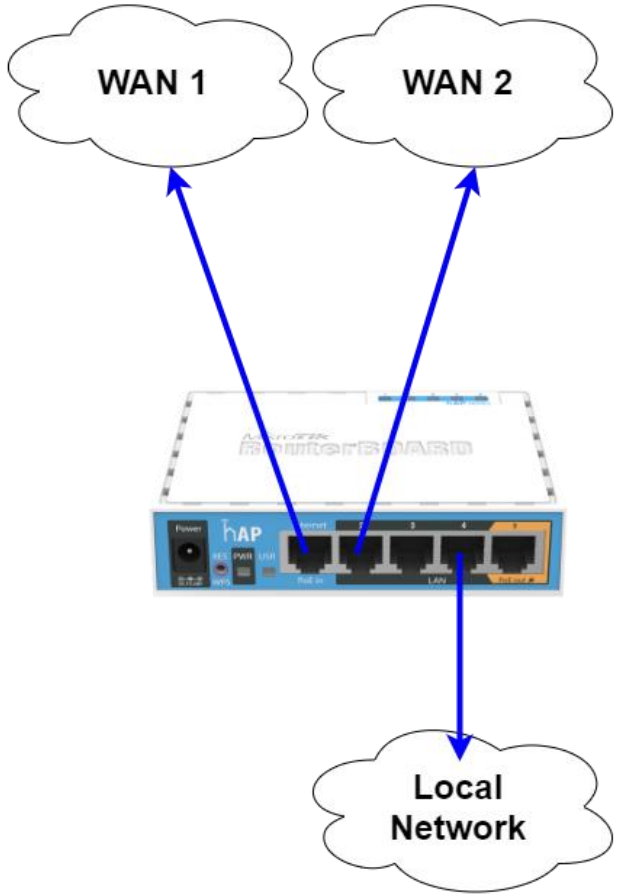
- MikroTik Router as Gateway Router

Problem



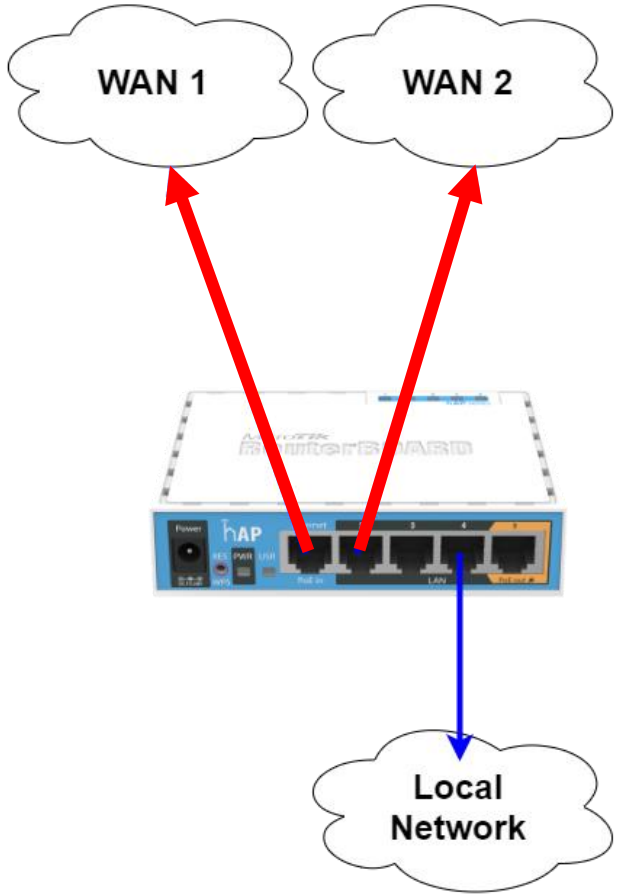
- If the Internet Gateway is down or unreacheable, the local network will not be able to access the Internet

Solution



- Add another Internet Gateway
- MikroTik Router as Load Balancer
- Multiple Internet Connection

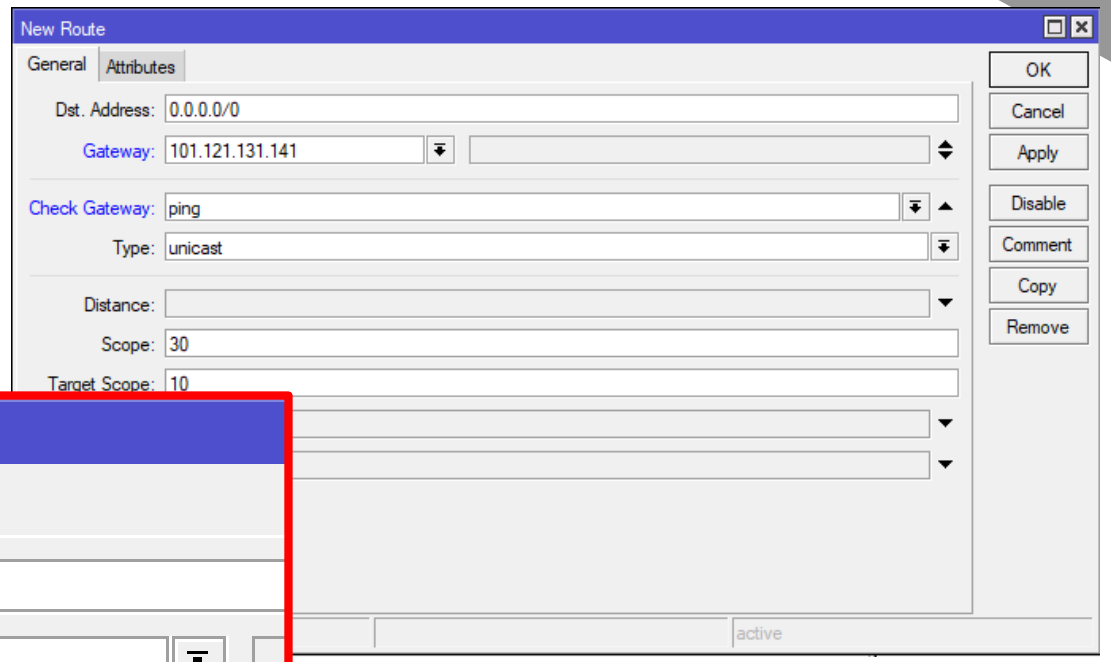
Problem

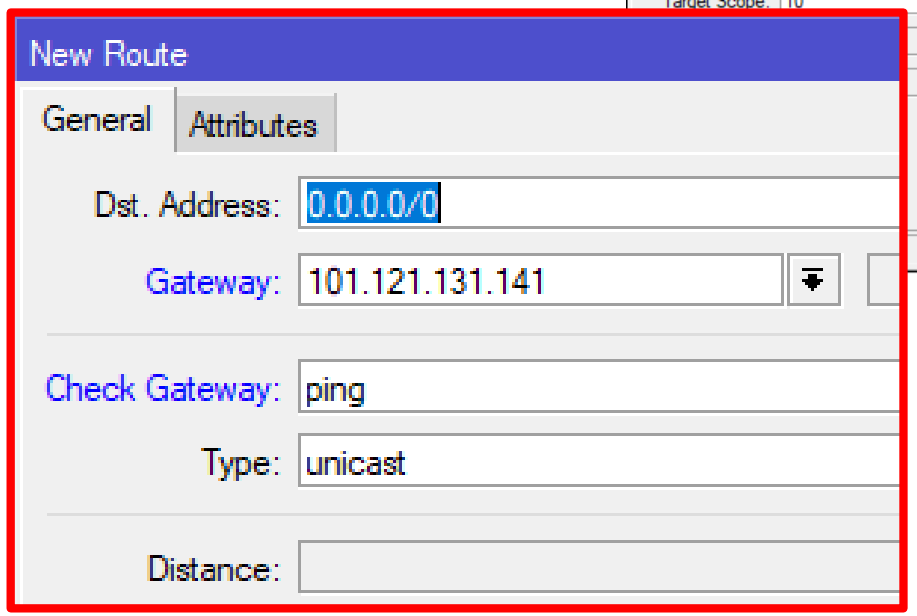


- How can we check the Internet Gateway status?

Solution

- Activate “Check Gateway” feature on /ip route
- If a gateway become unreacheable, the gateway will not be used

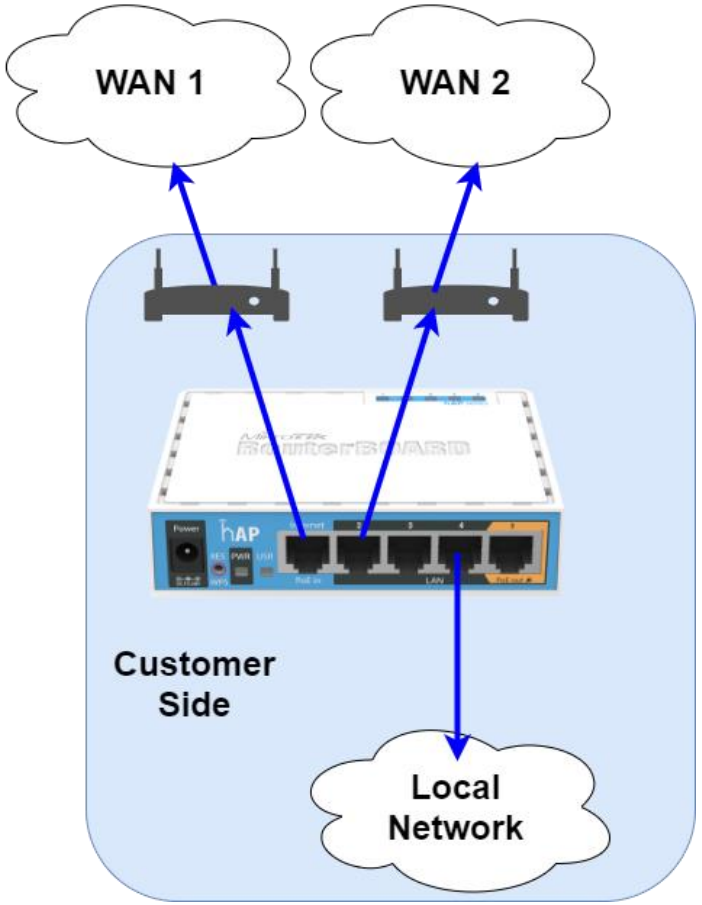




*ping
*arp

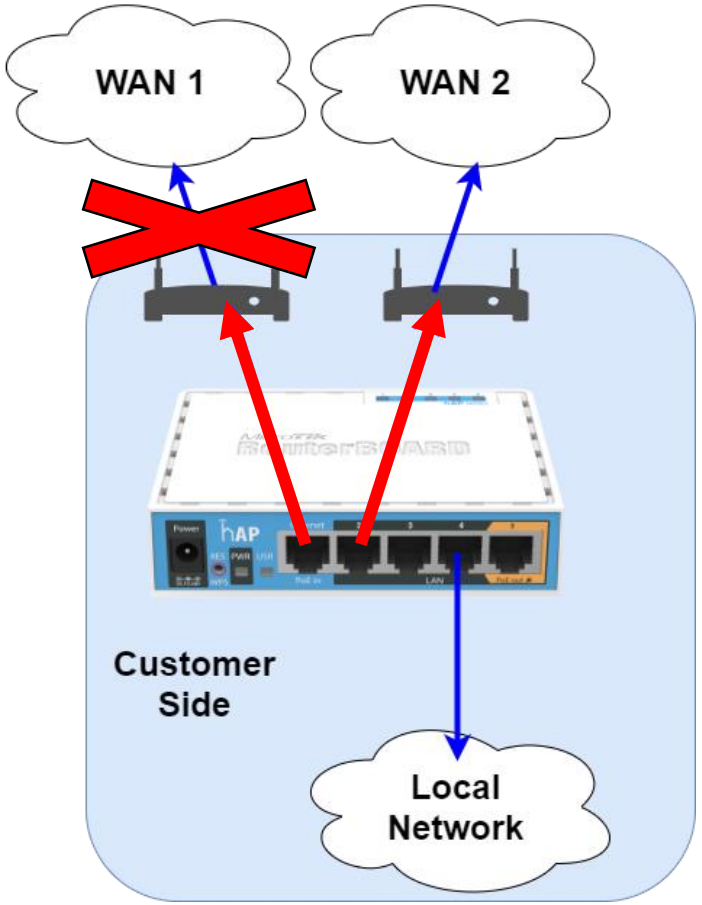
Problem

- The solution will works great on PTP connection (such as PPPoE, L2TP, or PPTP), and direct Public IP which is the default gateway is on the ISP Side.
- If the gateway located on the ISP Modem, the problem will be different



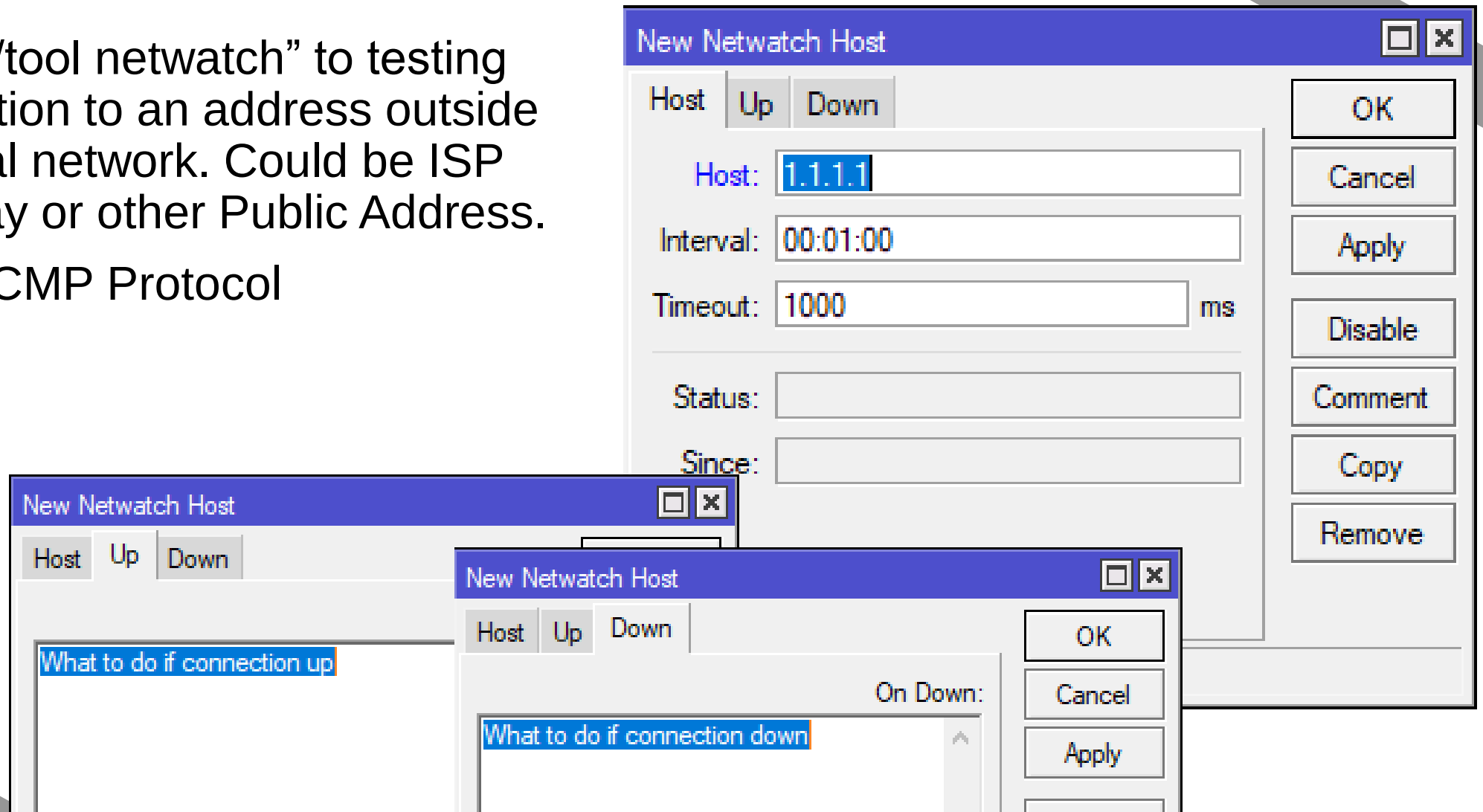
Problem

- If the Internet Connection Unreachable, the MikroTik Router still can access the Gateway Modem, then it will never know the connection status, and the MikroTik Router still forward the packet to the modem



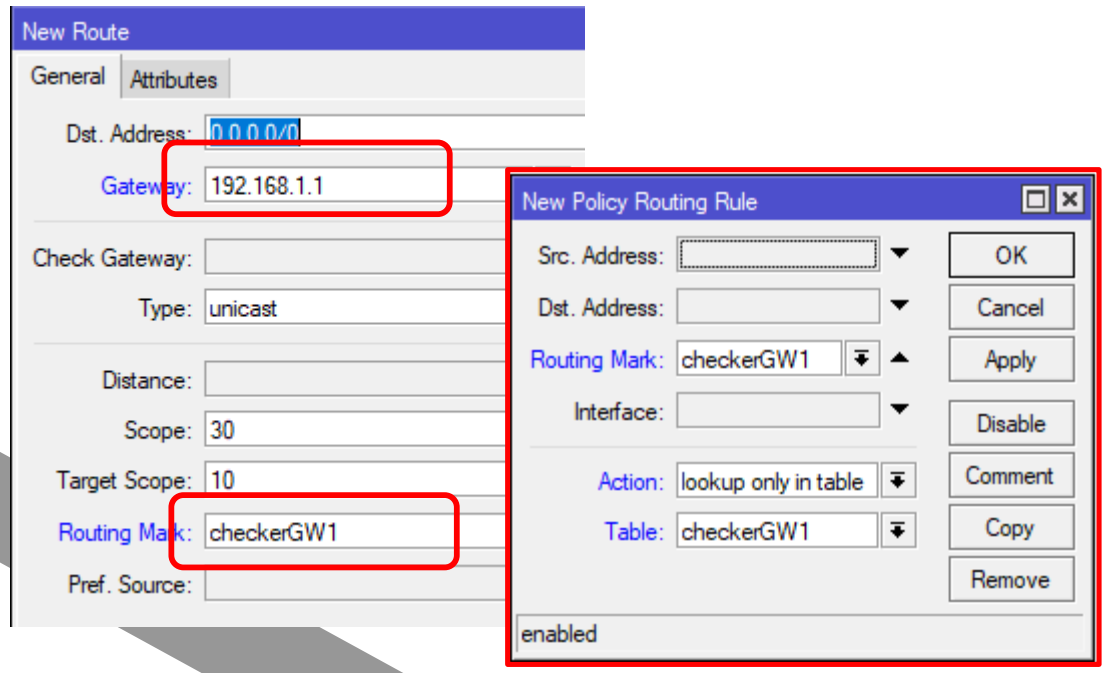
Solution

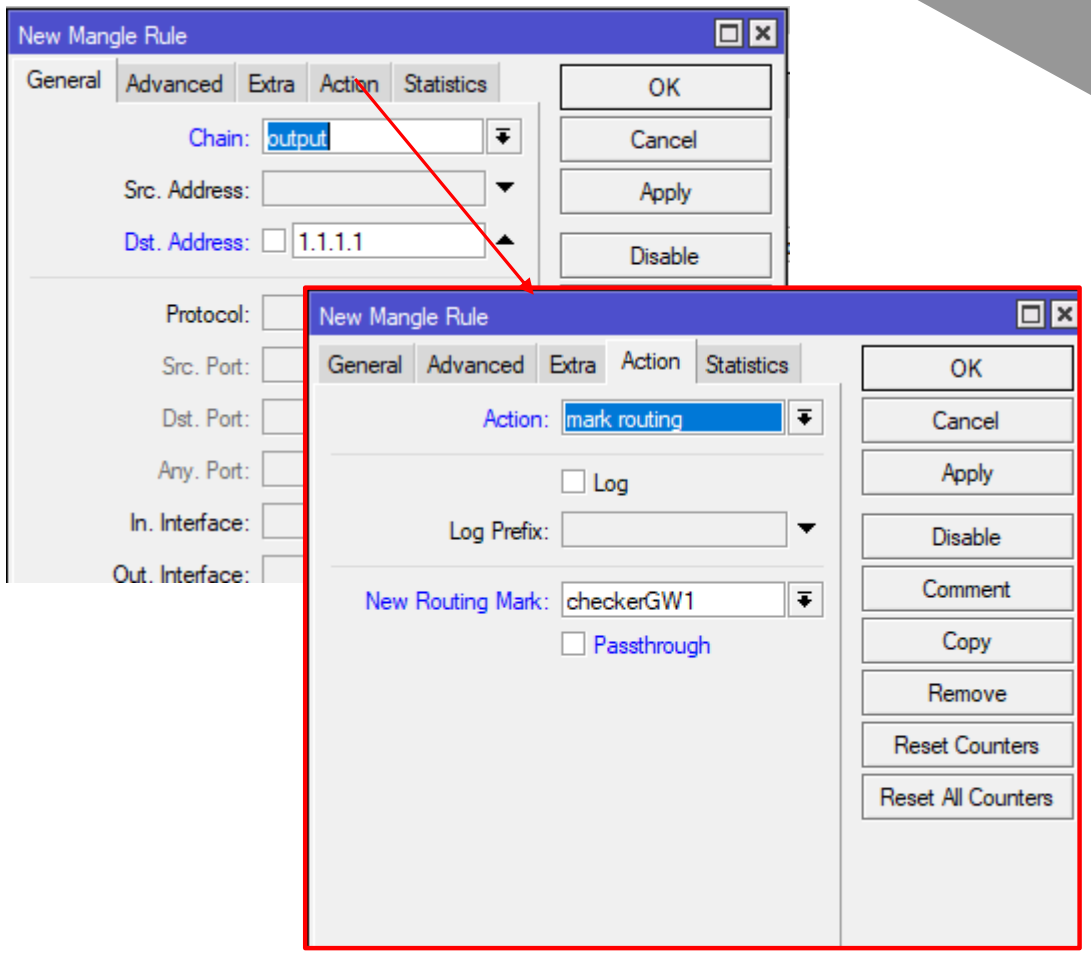
- Using “/tool netwatch” to testing connection to an address outside the local network. Could be ISP Gateway or other Public Address.
- Using ICMP Protocol



Solution

- Make sure the traffic to the test address only forwarded to a certain gateway.
- Using Mangle and IP Route



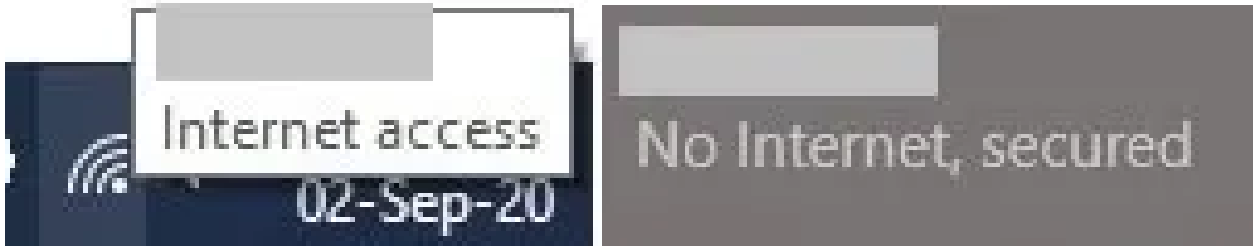


Problem

- Some ISP in Indonesia, on some cases they allowed ICMP Traffic, but divert other traffic. For example when the customer haven't paid the Internet's bill, they will divert the browser traffic to a web server that will say "**You must complete the payment first**", but still allow the ICMP Traffic.
- This case will not be detected by the last checker we've created, because "/tool netwatch" is using ICMP Protocol.

Solution

- We need a solution such as “windows network connectivity status indicator (NCSI)”



How NCSI works

- The NCSI works in two critical steps to check the internet's status that the computer is connected to. These two tasks are performed independently.

1. NCSI performs a DNS lookup for www.msftconnecttest.com, and then sends out an **HTTP Get request** to http://www.msftncsi.com/ncsi.txt **and downloads the text file**. This is a plain-text file that contains "Microsoft connect test."
2. NCSI also performs a DNS lookup for dns.msftncsi.com and checks to see if the corresponding IP address is 131.107.255.255.

https://www.itechtics.com/ncsi/

NCSI on RouterOS

Basic ideas:

1. Download file to a certain server
2. If file=valid Then “Connected”
   else “Disconnected”

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```
/tool fetch mode=http url=
http://www.msftncsi.com/ncsi.txt
```

NCSI on RouterOS

Basic ideas:

1. Download file to a certain server
2. If file=valid Then “Connected”
   else “Disconnected”

```
:global x value=[/file get ncsi.txt contents]
:if ($x = "Microsoft connect test.") do={
        /log info message="UP"
} else={
        /log info message="DOWN"
}
```

Action when connection UP

Action when connection DOWN

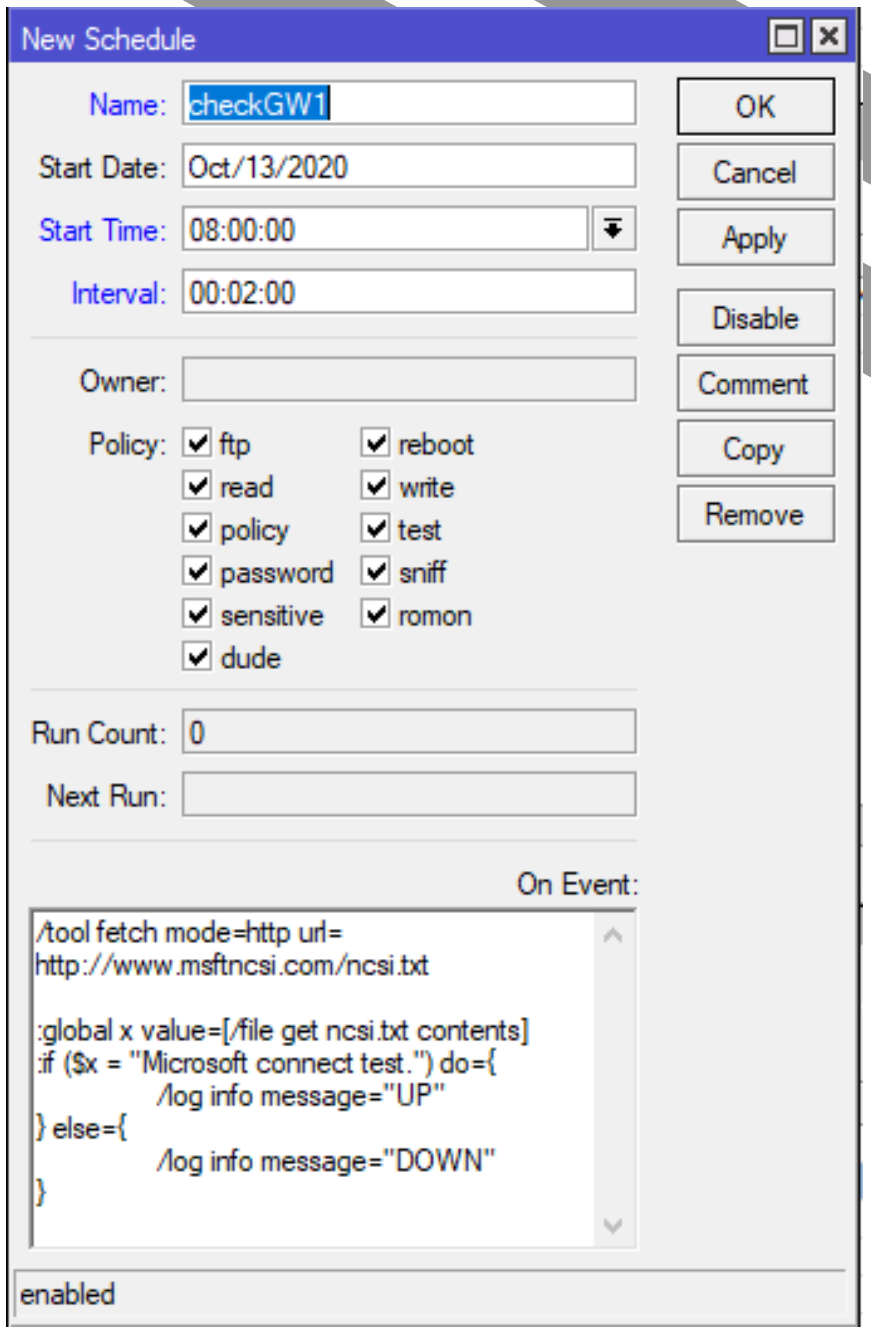
NCSI on RouterOS

Basic ideas:

1. Download file to a certain server
2. If file=valid Then “Connected” else “Disconnected”

Next:

- Put everything on /system scheduler



NCSI on RouterOS

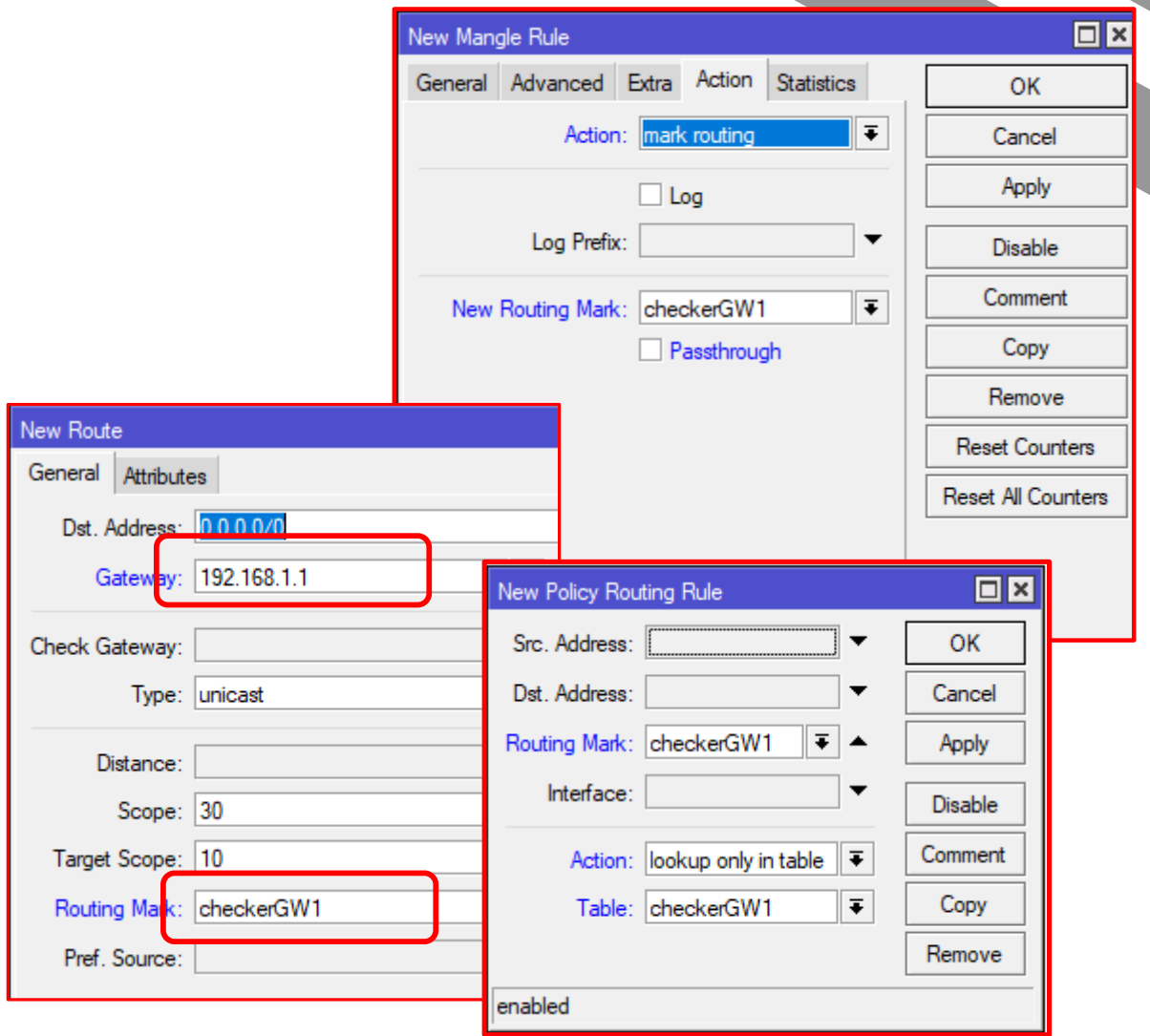
Basic ideas:

1. Download file to a certain server
2. If file=valid Then “Connected” else “Disconnected”

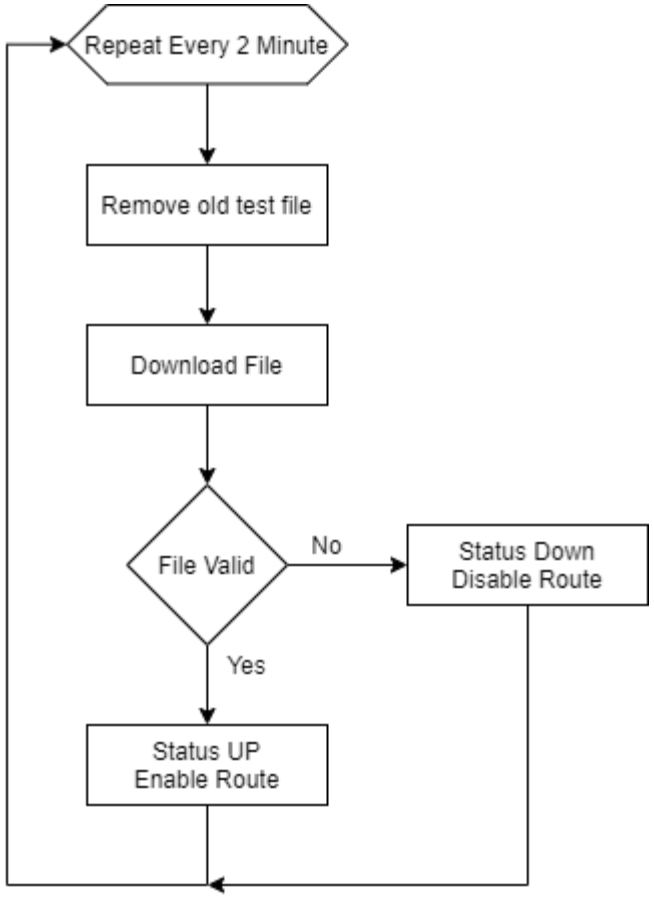
Next:

- Put everything on /system scheduler

P.S: Don’t forget to add mangle rule to make sure the traffic to the test address only forwarded to a certain gateway.



NCIS Flowchart Diagram



Notes

- 1 set of script, for 1 gateway
- 1 target test address, for 1 gateway
- Test address can be built with your own web server

Conclusion

- Scripting can be helpful for doing monitoring and automation
- Sometimes ICMP checking is not enough to check Internet connection status

WASH YOUR HANDS
WEAR YOUR MASK
PHYSICAL DISTANCING

Q & A

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