



Simulasi mikrotik dalam persiapan uji kompetensi siswa teknik komputer dan jaringan menggunakan virtual box

SMK Informatika Pesat Kota Bogor

Biodata pemateri

- ✓ **Nama : Dedi Kiswanto**
- ✓ **Pekerjaan :**
 - a. Staff pengajar dan pendidik di SMK Informatika Pesat Kota Bogor**
 - b. Teknisi Lepas**
- ✓ **Mengenal dan menggunakan mikrotik sejak 2013 berkat peran Indonesia Networkers (IDN) dan Mr. Ziad Sobri**
- ✓ **www.idn.id**
- ✓ **Kontak : 0852769893434**
- ✓ **Email : kiswanto.dedi@gmail.com**



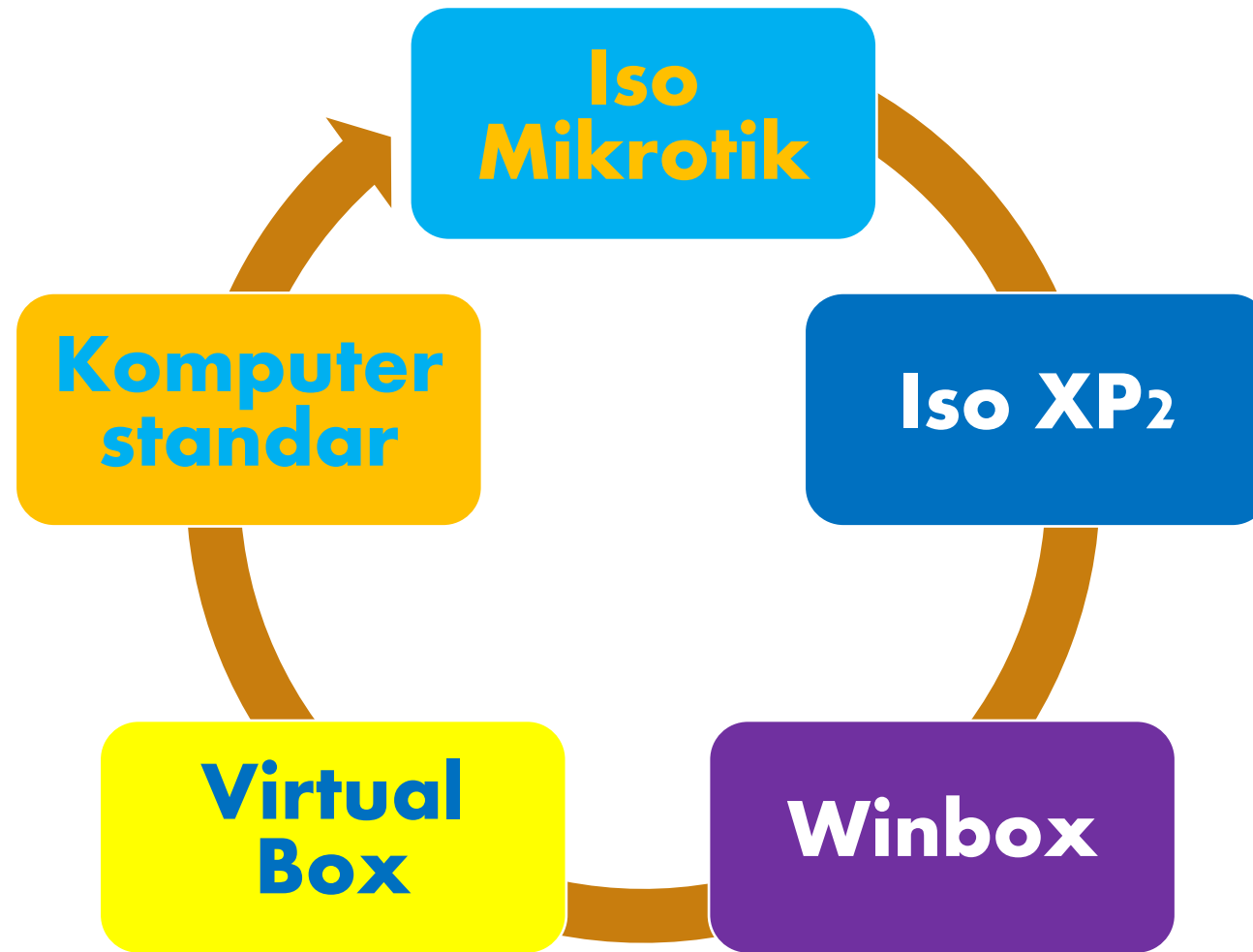
Mengapa mikrotik

Secara umum mudah dimengerti dan mudah di implementasikan

Secara umum industri menengah kebawah menggunakan mikrotik sehingga membuka peluang bagi alumni smk teknik komputer dan jaringan mengambil peran sebagai teknisi

Perangkat murah tapi tidak murahan :D

Tools konfigurasi



Topologi simulasi pembelajaran



➤ **Koneksi internet didapat dari share internet dari koneksi komputer/leptop**

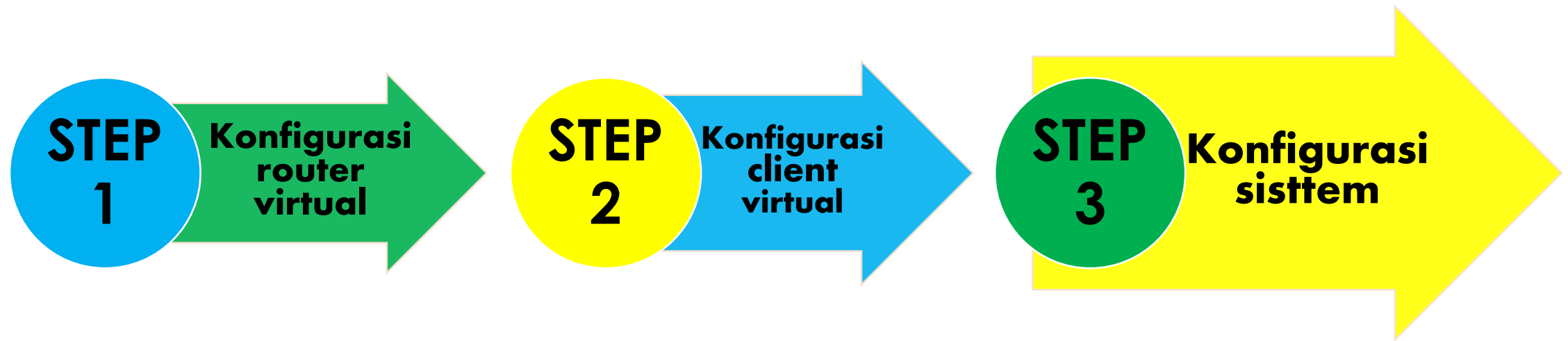
- **NAT (Network Address translation)**
- **DHCP Server**
- **Proxy**
- **Block Website**
- **QOS (Quality Of Service)**
- **Dll...**



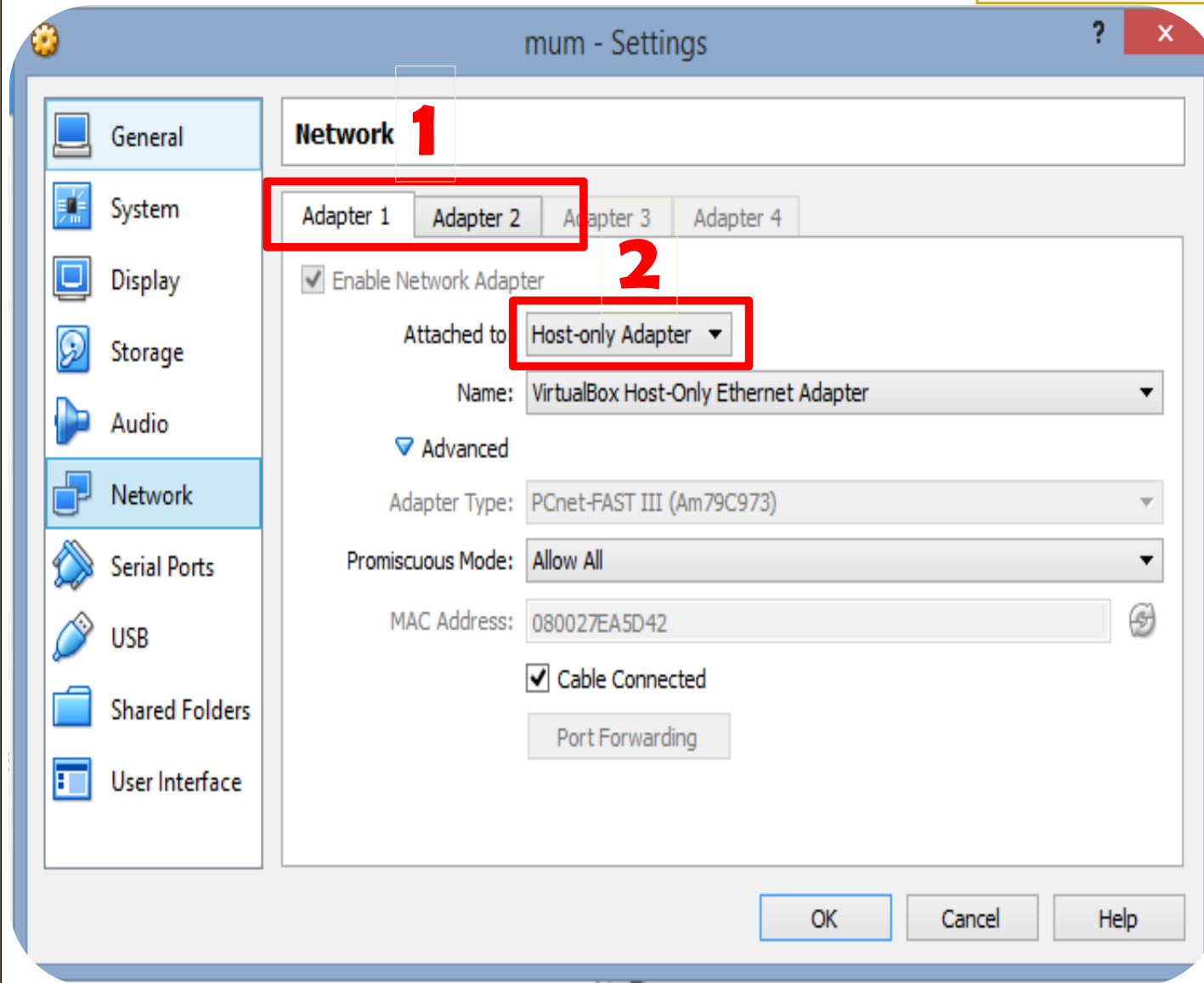
**Client
Windows XP₂**



Proses pengerjaan



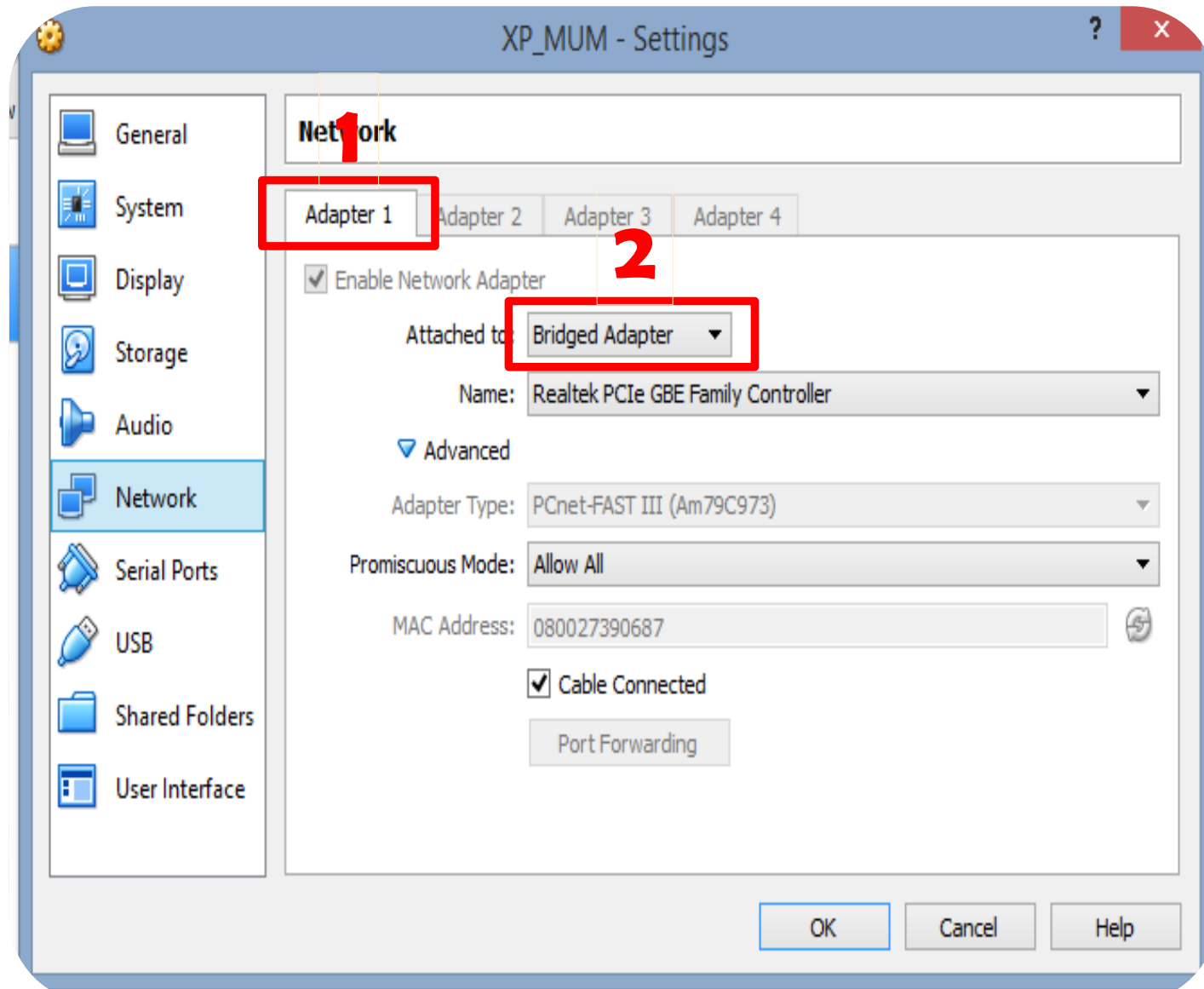
Step 1 : mesin router virtual



➤ Network adapter 1: Host Only Adapter network ini berfungsi untuk share koneksi internet ke mesin router virtual

➤ Network adapter 2: Bridge adapter, network ini berfungsi sebagai penghubung dengan client dan harus memiliki tipe yang sama dengan network adapter mesin virtual client

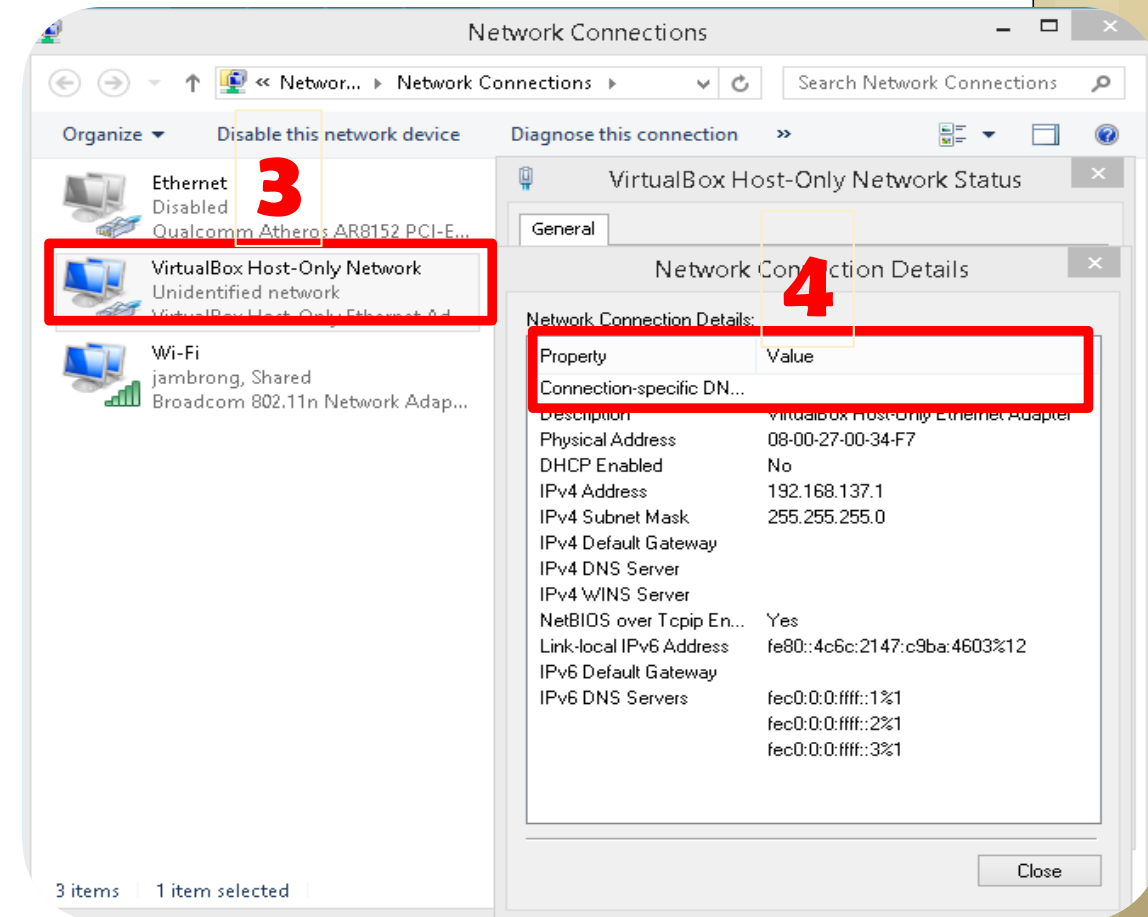
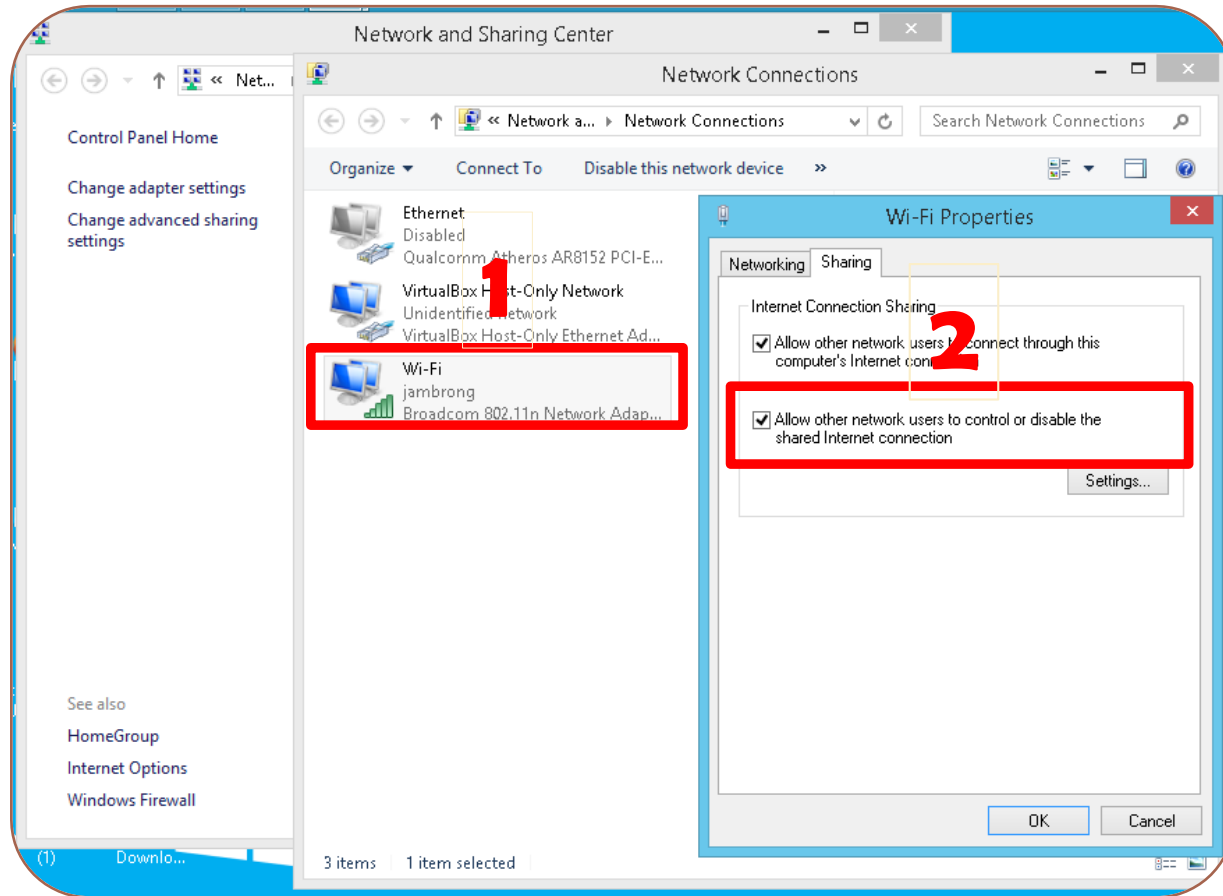
Step 2 : mesin pc client



- Network adapter 1: Bridged adapter berfungsi sebagai penghubung dengan network router dan harus disamakan tipe networknya dengan network 2 mesin router

Step 3 : Konfigurasi sistem

Share internet ke mesin router virtual



Step 3 : ip address router

The screenshot shows the Mikrotik WinBox interface. On the left sidebar, the 'IP' menu is highlighted with a red box and the number '1'. The 'Addresses' option under 'IP' is also highlighted with a red box and the number '2'. The main window displays the 'Address List' table with columns for 'Address', 'Network', and 'Interface'. A 'New Address' dialog box is open, showing the 'Address' field with '192.168.137.10/24' (highlighted with a red box and number '3') and the 'Interface' field with 'ether1' (highlighted with a red box and number '4'). The 'enabled' checkbox is checked at the bottom of the dialog.

- Nomor 3 : IP yang digunakan harus satu kelas dengan ip hasil share pada network virtual sebelumnya.
- Nomor 4 : interface yang kita gunakan harus interface yang terhubung ke network virtual yakni ether1

Step 3 : ip gateway

The screenshot shows the Mikrotik WinBox interface. In the left sidebar, the 'IP' menu item is highlighted with a red box and a red '1'. Below it, the 'Routes' menu item is highlighted with a red box and a red '2'. The 'New Route' dialog box is open, showing the following configuration:

- Dst. Address:** 0.0.0.0/0 (highlighted with a red box and a red '3')
- Gateway:** 192.168.137.1 (highlighted with a red box and a red '4')
- Check Gateway:** (highlighted with a red box and a red '4')

➤ **Nomor 3 :** ip ini berfungsi untuk menampung ip tujuan apapun akan bisa dituju.

➤ **Nomor 4 :** Ip Gateway yang digunakan adalah ip pertama hasil sharing pada mesin virtual

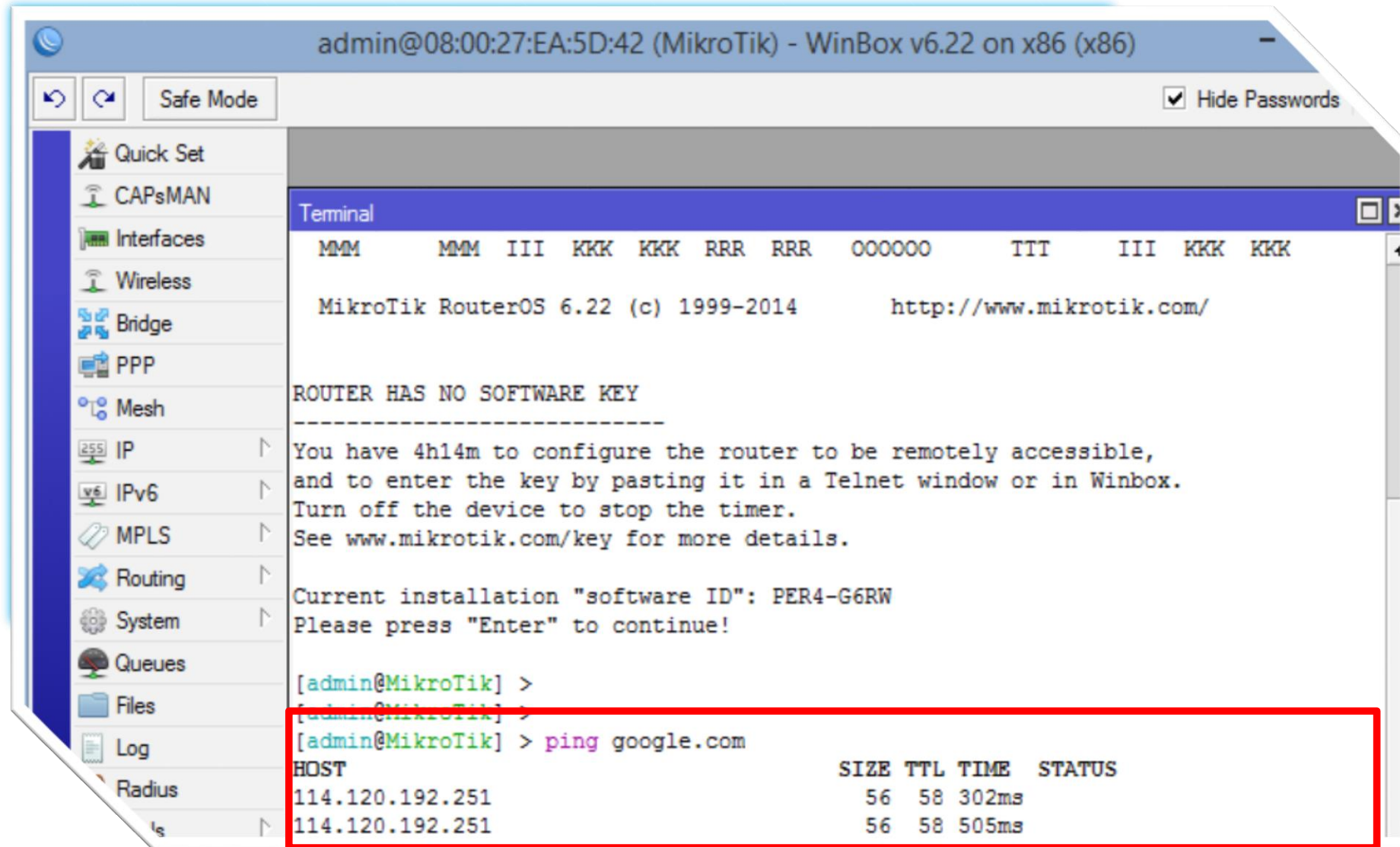
Step 3 : NAT (network address translation)

The screenshot shows the Mikrotik WinBox interface. On the left sidebar, the 'IP' menu item is highlighted with a red box. In the main window, the 'Firewall' menu item is also highlighted with a red box. A 'Rule' configuration window is open, showing the 'General' tab. The 'Chain' dropdown is set to 'srcnat' and is highlighted with a red box. The 'Out. Interface' dropdown is set to 'ether1' and is also highlighted with a red box. Other fields like 'Src. Address', 'Dst. Address', 'Protocol', 'Src. Port', 'Dst. Port', 'Any. Port', 'In. Interface', and 'Packet Mark' are visible but not highlighted.

- Chain = srcnat.
- Out-interface = ether1 ini kita gunakan karena kita menggunakan interface ini untuk koneksi internet.
- Action = masquerade

The screenshot shows the 'NAT Rule' configuration window in Mikrotik WinBox. The 'Action' dropdown is set to 'masquerade' and is highlighted with a red box. The 'Log' checkbox is unchecked, and the 'Log Prefix' field is empty.

Hasil koneksi internet



The screenshot shows the Mikrotik WinBox interface. The terminal window displays the following text:

```
admin@08:00:27:EA:5D:42 (MikroTik) - WinBox v6.22 on x86 (x86)
Safe Mode [x] Hide Passwords

Terminal
MMM   MMM  III  KKK  KKK  RRR  RRR  OOOOOO   TTT   III  KKK  KKK

MikroTik RouterOS 6.22 (c) 1999-2014      http://www.mikrotik.com/

ROUTER HAS NO SOFTWARE KEY
-----
You have 4h14m to configure the router to be remotely accessible,
and to enter the key by pasting it in a Telnet window or in Winbox.
Turn off the device to stop the timer.
See www.mikrotik.com/key for more details.

Current installation "software ID": PER4-G6RW
Please press "Enter" to continue!

[admin@MikroTik] >
[admin@MikroTik] >
[admin@MikroTik] > ping google.com
HOST                SIZE  TTL  TIME  STATUS
114.120.192.251     56   58  302ms
114.120.192.251     56   58  505ms
```

The terminal output shows a successful ping to google.com with a response time of 302ms. The table below summarizes the ping results:

HOST	SIZE	TTL	TIME	STATUS
114.120.192.251	56	58	302ms	
114.120.192.251	56	58	505ms	

IP PC Client

Sessions Settings Dashboard

Safe Mode Session: 08:00:27:67:93:19

Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP 1
Mesh

IP 2
IPsec
MPLS
Routing
System
Queues
Files
Log
Radius
Tools
New Terminal
Channels

ARP
Accounting
Addresses
DHCP Client
DHCP Relay 2
DHCP Server
DNS
Firewall
Hotspot
IPsec
Neighbors
Packing
Pool

Address	Network	Interface
192.168.137.1	192.168.137.0	ether1
202.100.4.1/24	202.100.4.0	ether2

Address <202.100.4.1/24> 3

Address: 202.100.4.1/24 4
Network: 202.100.4.0
Interface: ether2 4

enabled

- **Nomor 3 : IP Gateway yang akan digunakan untuk pc client**
- **Nomor 4 : interface yang digunakan ether2 yang tipenya disamakan dengan network pc client**

IP dhcp untuk client

Safe Mode

- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Mesh
- IP**
- IPv6
- MPLS
- Routing
- System
- Queues
- Files
- Log
- Radius
- Tools
- New Terminal

- ARP
- Accounting
- Addresses
- DHCP Client
- DHCP Relay**
- DHCP Server
- DNS
- Firewall
- Hotspot
- IPsec
- Neighbors

DHCP Server

DHCP Networks Leases Options Option Sets Alerts

+ - ✓ ✕ 🔍 DHCP Config DHCP Setup Find

Name	Interface	Relay	Lease Time	Address Pool	Add AR...
0 items					

Select interface to run DHCP server on

DHCP Server Interface: ether2

Back Next Cancel

DHCP Setup

Select network for DHCP addresses

DHCP Address Space: 202.100.4.0/24

Back Next Cancel

DHCP Server

DHCP Networks Leases Options Option Sets Alerts

+ - ✓ ✕ 🔍 DHCP Config DHCP Setup Find

Name	Interface	Relay	Lease Time	Address Pool	Add AR...
dhcp1	ether2		3d 00:00:00	dhcp_pool1	no

➤ Konfigurasi ini berfungsi untuk memberikan ip dhcp dari route virtual ke pc client virtual

IP hasil dhcp

The screenshot shows the Windows Network and Sharing Center with the 'Local Area Connections' window open. The 'Network Connection Details' window is displayed over it, showing a table of network properties. A red box highlights the IP-related information.

Property	Value
Connection-specific DN...	
Description	Intel(R) PRO/1000 MT Desktop Adap
Physical Address	08-00-27-CC-12-2F
DHCP Enabled	Yes
IPv4 Address	202.100.4.254
IPv4 Subnet Mask	255.255.255.0
Lease Obtained	Monday, October 05, 2015 11:32:04 F
Lease Expires	Tuesday, October 06, 2015 12:32:04
IPv4 Default Gateway	202.100.4.1
IPv4 DHCP Server	202.100.4.1
IPv4 DNS Servers	202.100.4.1 192.168.1.371
IPv4 WINS Server	
NetBIOS over Tcpip En...	Yes
Link-local IPv6 Address	fe80::e97c:1ca6:e95b:f298%11
IPv6 Default Gateway	

The taskbar at the bottom shows the system clock as 11:35 PM on 10/5/2015.

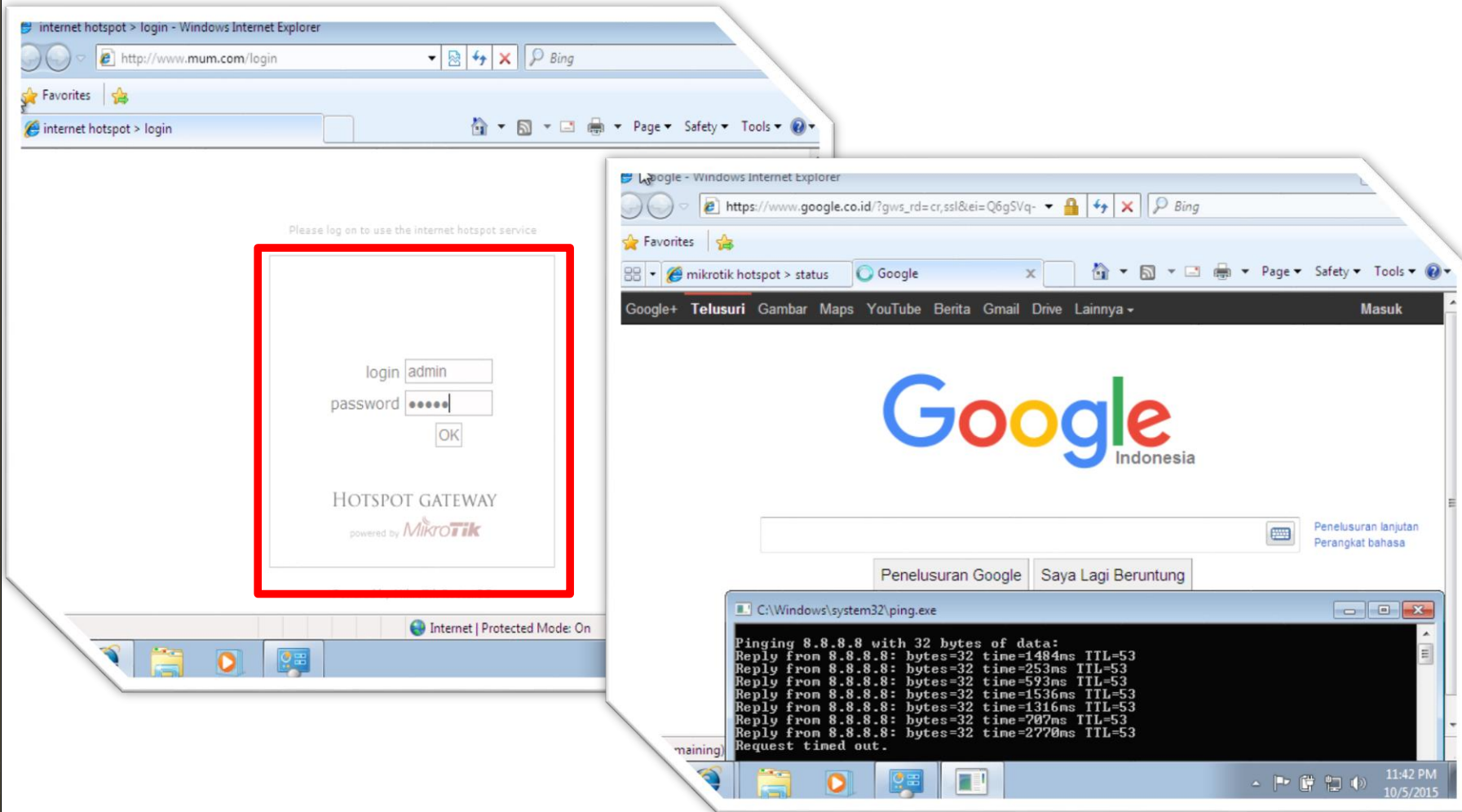
Captive portal

The image shows the Mikrotik WinBox interface with the following components:

- Sidebar:** A list of configuration categories including Quick Set, CAPsMAN, Interfaces, Wireless, Bridge, PPP, Mesh, IP (highlighted), IPv6, MPLS, Routing, System, Queues, Files, Log, Radius, Tools, and New Terminal. The 'Hotspot' option is also visible in the main menu.
- Main Window:** Titled 'Hotspot', it contains tabs for Servers, Server Profiles, Users, User Profiles, Active, Hosts, IP Bindings, Service Ports, Walled Garden, and Walled Garden IP List. The 'Hotspot Setup' tab is active, showing a table with columns for Name, Interface, Address Pool, Profile, and Addresses.
- Dialog 1:** 'Hotspot Setup' dialog with the prompt 'Select interface to run HotSpot on'. The 'HotSpot Interface' dropdown is set to 'ether2'.
- Dialog 2:** 'Set HotSpot address for interface' dialog with 'Local Address of Network' set to '202.100.4.1/24' and the 'Masquerade Network' checkbox checked.
- Dialog 3:** 'Create local HotSpot user' dialog with 'Name of Local HotSpot User' set to 'admin' and 'Password for the User' set to 'admin'.

Red arrows indicate the flow of the configuration process from the sidebar to the main window and through the three dialog boxes.

Nasil Captive Portal



- Setelah login dengan username dan password yang telah kita buat berikutnya kita dapat melakukan koneksi internet pada pc client

Next configuration

Block Site

**QOS
(Quality
Of Service)**

Block site "web proxy"

Web Proxy Settings

General Status Lookups Inserts Refreshes OK

Enabled

Src. Address: ..

Port: 3218

Anonymous

Parent Proxy: ..

Parent Proxy Port: ..

Cache Administrator: pesat

Max. Cache Size: unlimited

Max Cache Object Size: 2048

Cache On Disk

Max. Client Connections: 600

Max. Server Connections: 600

Max Fresh Time: 3d 00:00:00

Serialize Connections

Always From Cache

Cache Hit DSCP (TOS): 4

Cache Path: web-proxy

running

Web Proxy Access

+ - ✓ ✗ 📁 🗑️ 00 Reset Counters 00 Reset All Counters

#	Src. Address	Dst. Address	Dst. Port	Dst. Host	Path
0	202.100.4.0/24			www.youtube...	
1	202.100.4.0/24			www.detik.com	

2 items (1 selected)

Web Proxy Rule: 202.100.4.0/24

Src. Address: 202.100.4.0/24

Dst. Address: ..

Dst. Port: ..

Local Port: ..

Dst. Host: www.youtube.com

Path: ..

Method: ..

Action: deny

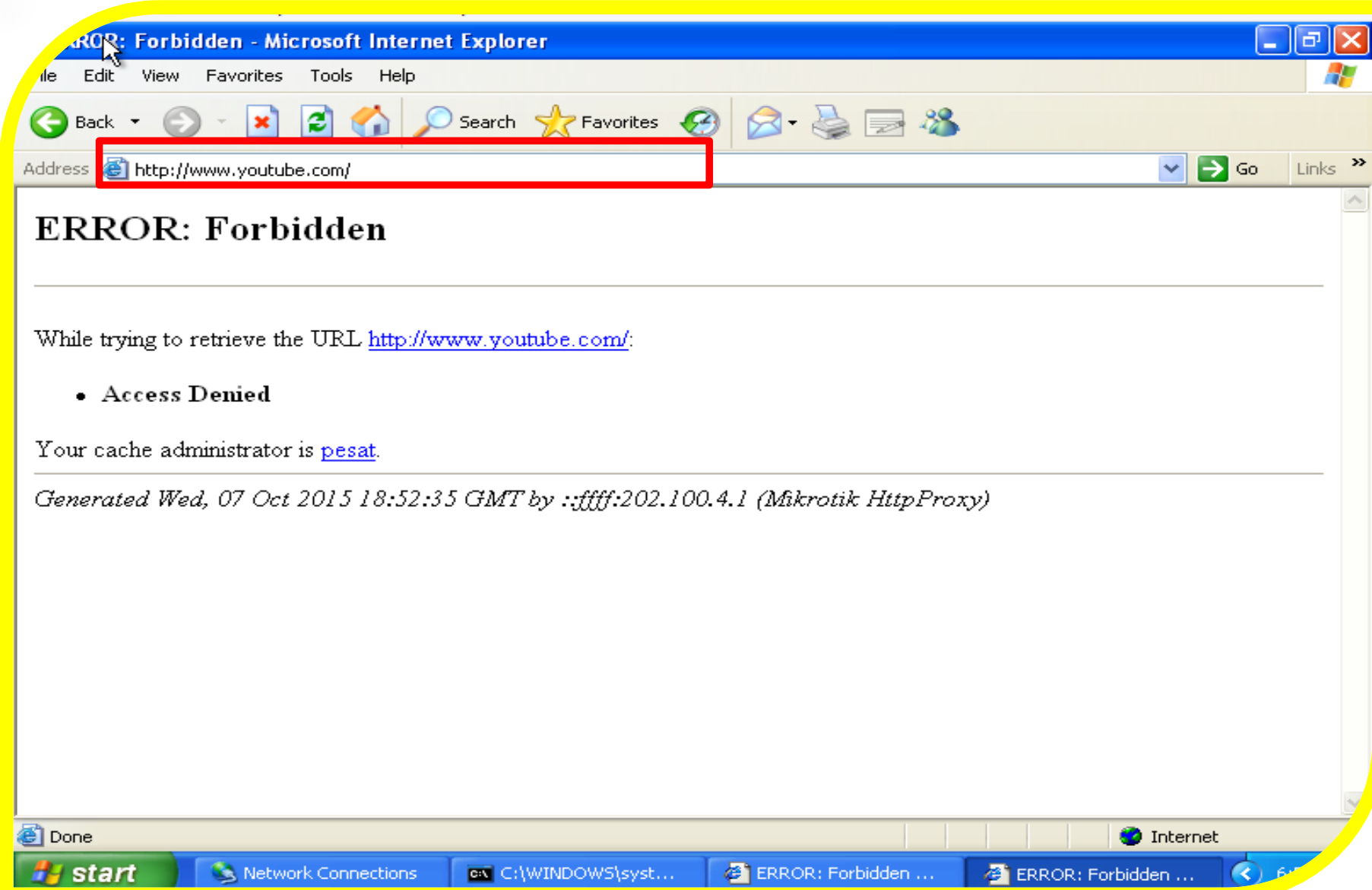
Redirect To: ..

Hits: 0

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

enabled

Hasil Block Site



QOS (queue)

Safe Mode

- Quick Set
- CAPsMAN
- Interfaces
- Wireless
- Bridge
- PPP
- Mesh
- IP
 - ARP
- IPv6
 - Accounting
- MPLS
 - Addresses
- Routing
 - DHCP Client
 - DHCP Relay
 - DHCP Server
- System
 - DHCP Server
- Queues
- Files
- Log
- Radius
- Tools
 - IPsec
- New Terminal
 - Neighbors

Queue List

Simple Queues | Interface Queues | Queue Tree | Queue Types

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

	Total Max Limit (bi...

New Simple Queue

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

Name:

Target:

Dst:

	Target Upload	Target Download	
Max Limit	<input type="text" value="128k"/>	<input type="text" value="128k"/>	bits/s

Burst

Burst Limit: bits/s

Burst Threshold: bits/s

Burst Time: s

Time

enabled

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

FINISH
Thank's