

Dynamic Location Based Advertisement on Hotspot Page

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About Me

- My name is Iwan Chandra / BelajarMikroTik.COM - Indonesia
- My activities:
 - Assistant Trainer at BelajarMikroTik.COM since 2013
 - MikroTik Academy Trainer for Sekolah Tinggi Teknik Surabaya
 - Asistant Lecture at Sekolah Tinggi Teknik Surabaya
 - IT Staff at Sekolah Tinggi Teknik Surabaya
 - MikroTik Certified Trainer (probably after 14.00 today)
- MikroTik Certification
 - MTCNA, MTCRE, MTCTCE, MTCWE, ACTR

BelajarMikroTik.COM

- Focused on MikroTik Training and Certification (MTCNA, MTCRE, MTCINE, MTCWE, MTCTCE, and MTCUME)
- Established in 2012 by a group of Independent MikroTik Certified Trainers (Herry Darmawan and Akbar Azwir)

Trainer

<http://www.belajarmikrotik.com/trainer/>



Herry Darmawan
Trainer



Akbar Azwir
Trainer



Slamet Suharko
Trainer



Antonius Duty Susilo
Trainer



Adhie Lesmana
Co-Trainer



Doni Kuswaryadi
Co-Trainer



Hariadi Yutanto
Co-Trainer



Apik Sulaksono
Co-Trainer



M. Nur Budiwijaya
Co-Trainer



Oktama Tija
Co-Trainer

Background of This Topic

- HotSpot used to provide and controlling Internet Access to users
- HotSpot page offer page customization
- HotSpot customization can be used for advertisement

The Problem,...

- HotSpot page is usually display static page
- And the advertisement can be same in all over hotspot area in a local area network
- Trust me! You don't want Burger King's Ads in a McDonald's Restaurants,...
- Unless you want it to be shown on purpose

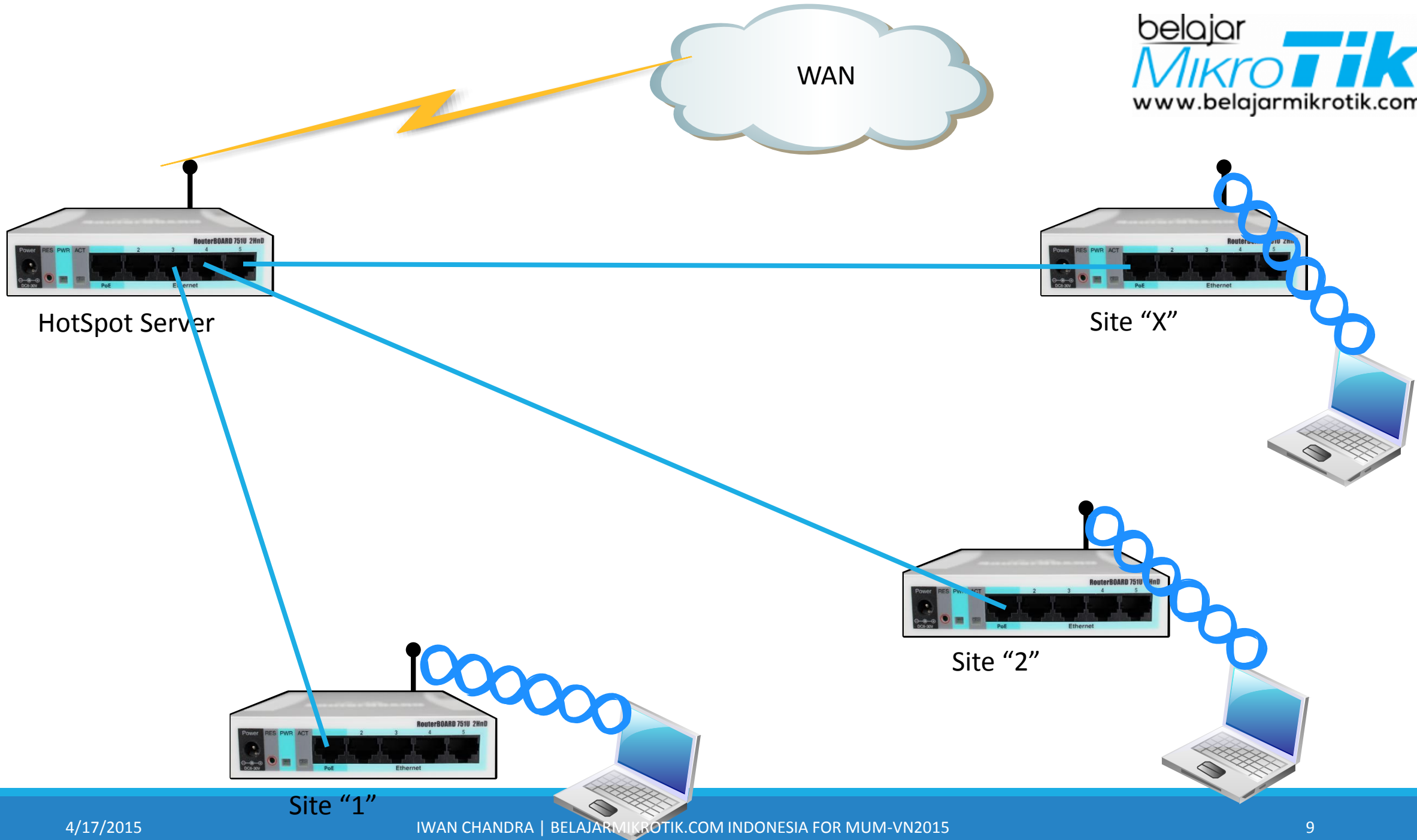


Objectives

Show different login page on different HotSpot Area
with one controlled HotSpot

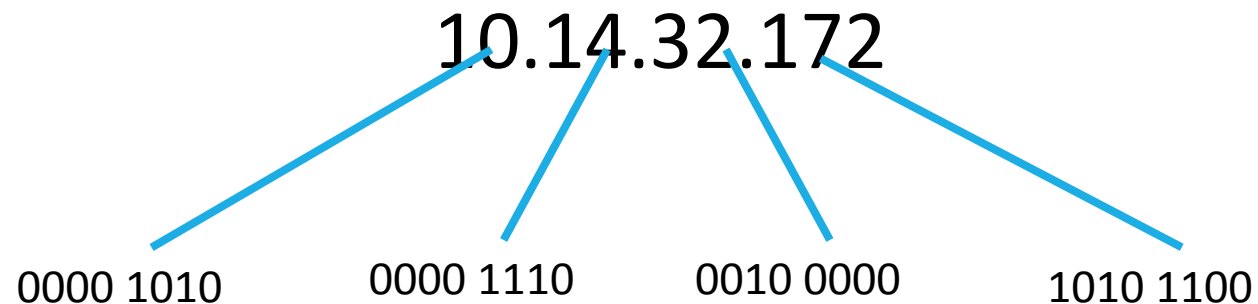
Tools and Techniques

- IPv4 Subnetting
- DHCP Server and Relay
- MikroTik HotSpot
- Network Address Translation
- Web Server with php5



IP version 4

- Use widely as universal logical addressing
- Consist of 32 bit of binary number
- Each 8 bit, represented with a decimal number



Subnetting

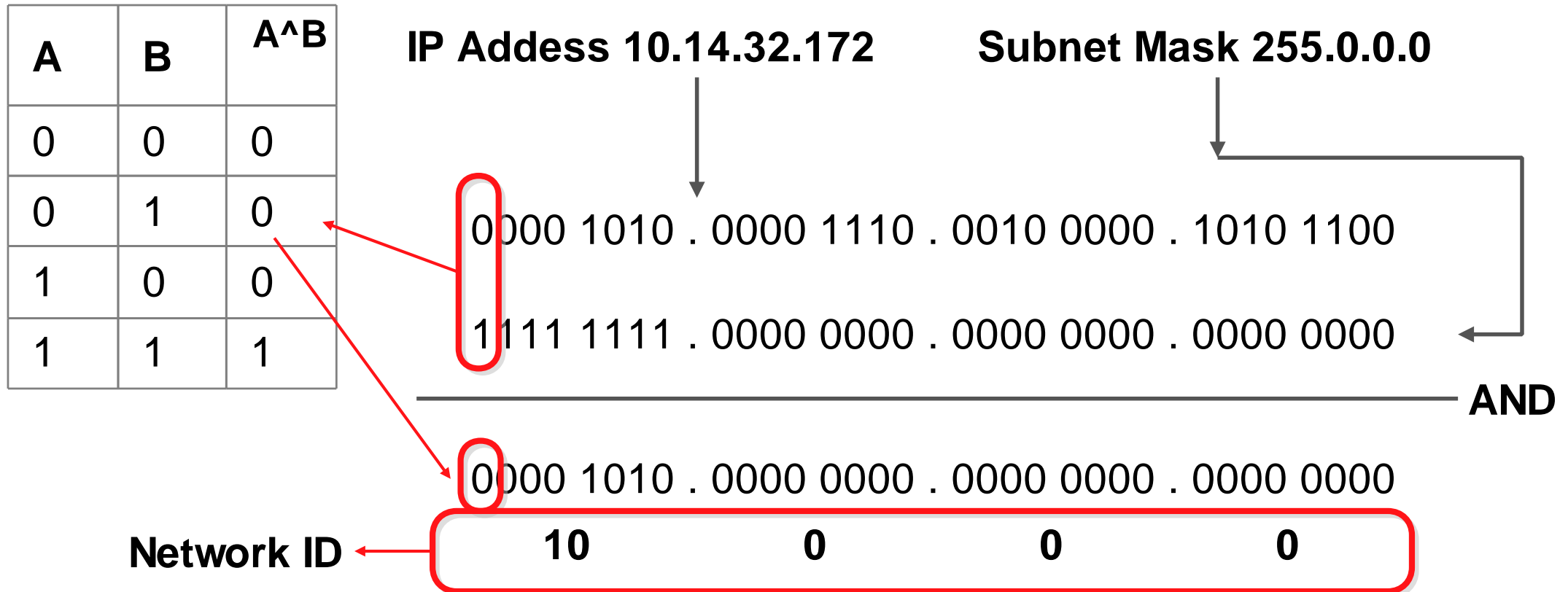
With IP Address and Subnet Mask, we can get:

- Network ID
- Broadcast Address
- Hosts

Example for address 10.15.17.32/8:

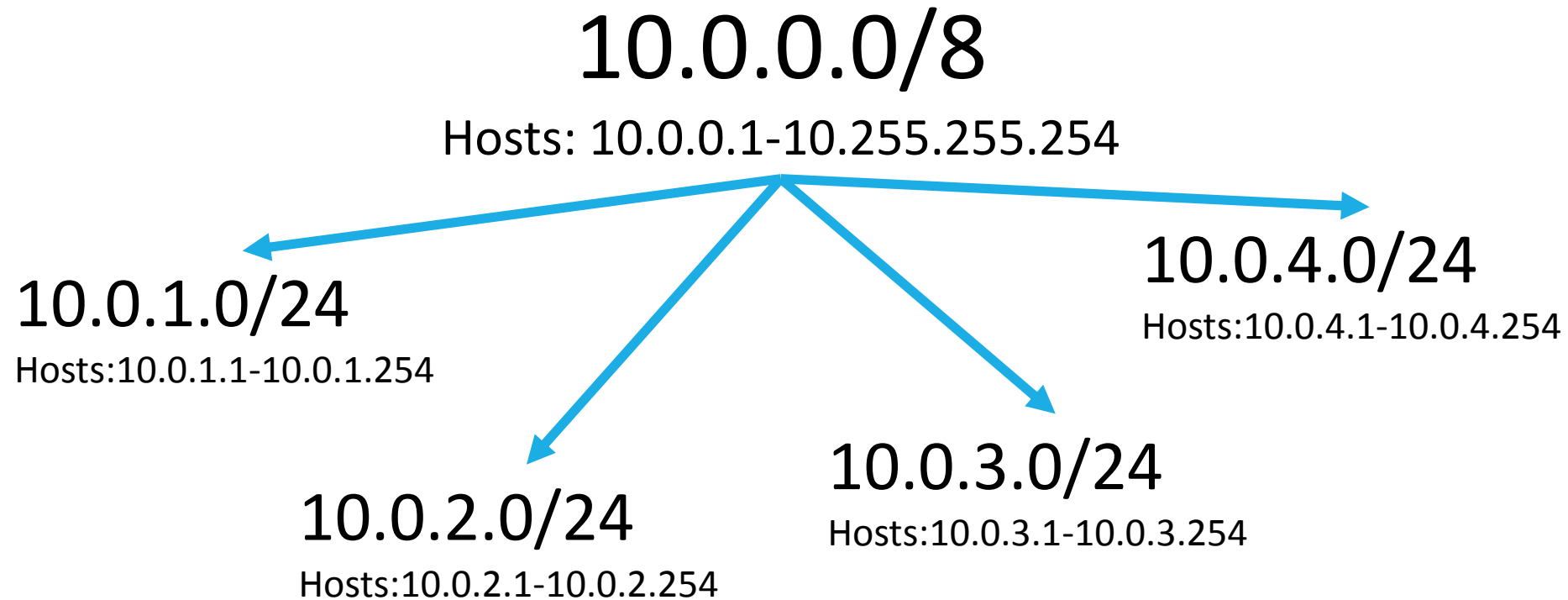
- Network ID: 10.0.0.0
- Broadcast Address: 10.255.255.255
- Hosts: 10.0.0.1-10.255.255.254 (16,777,214 host)

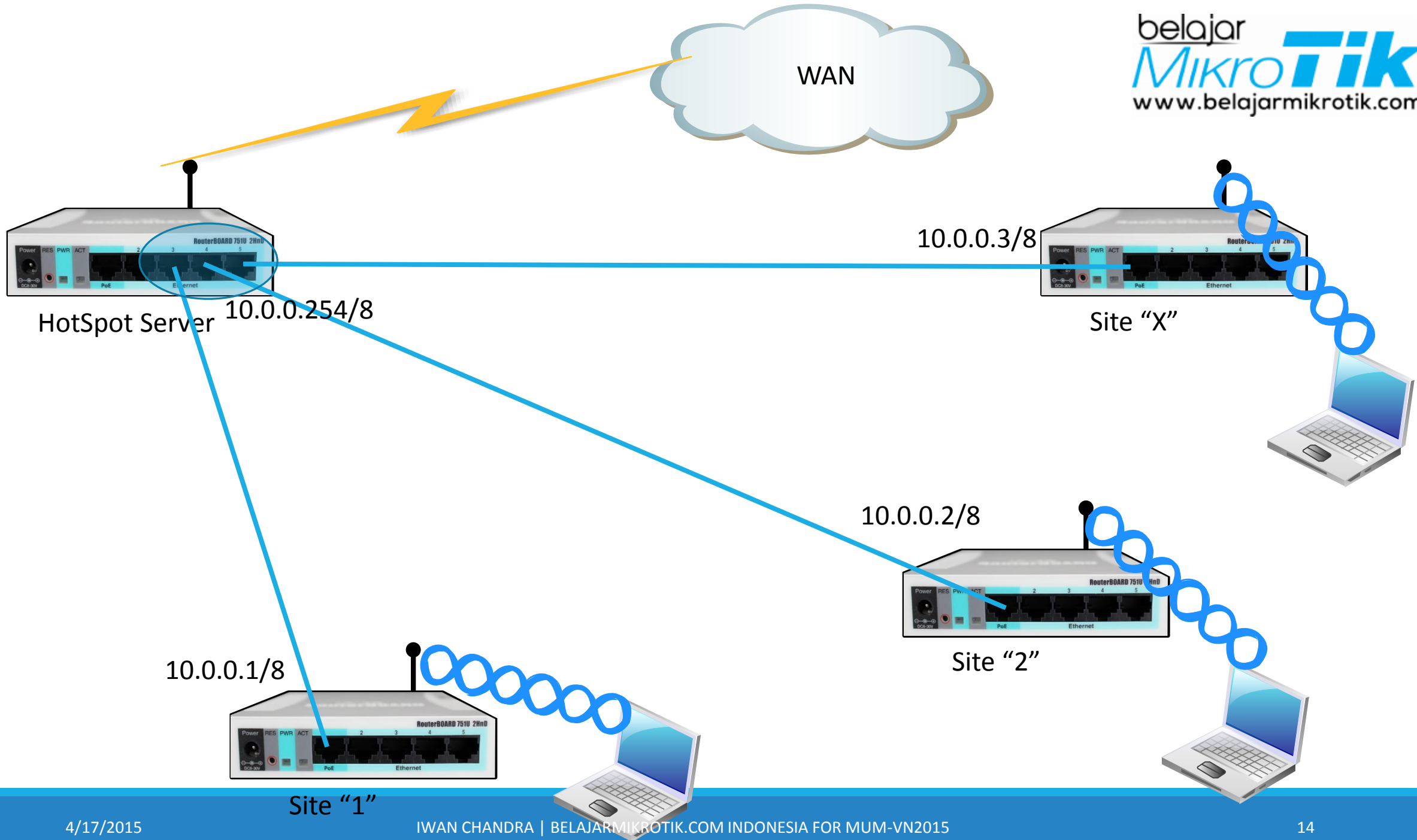
Subnetting

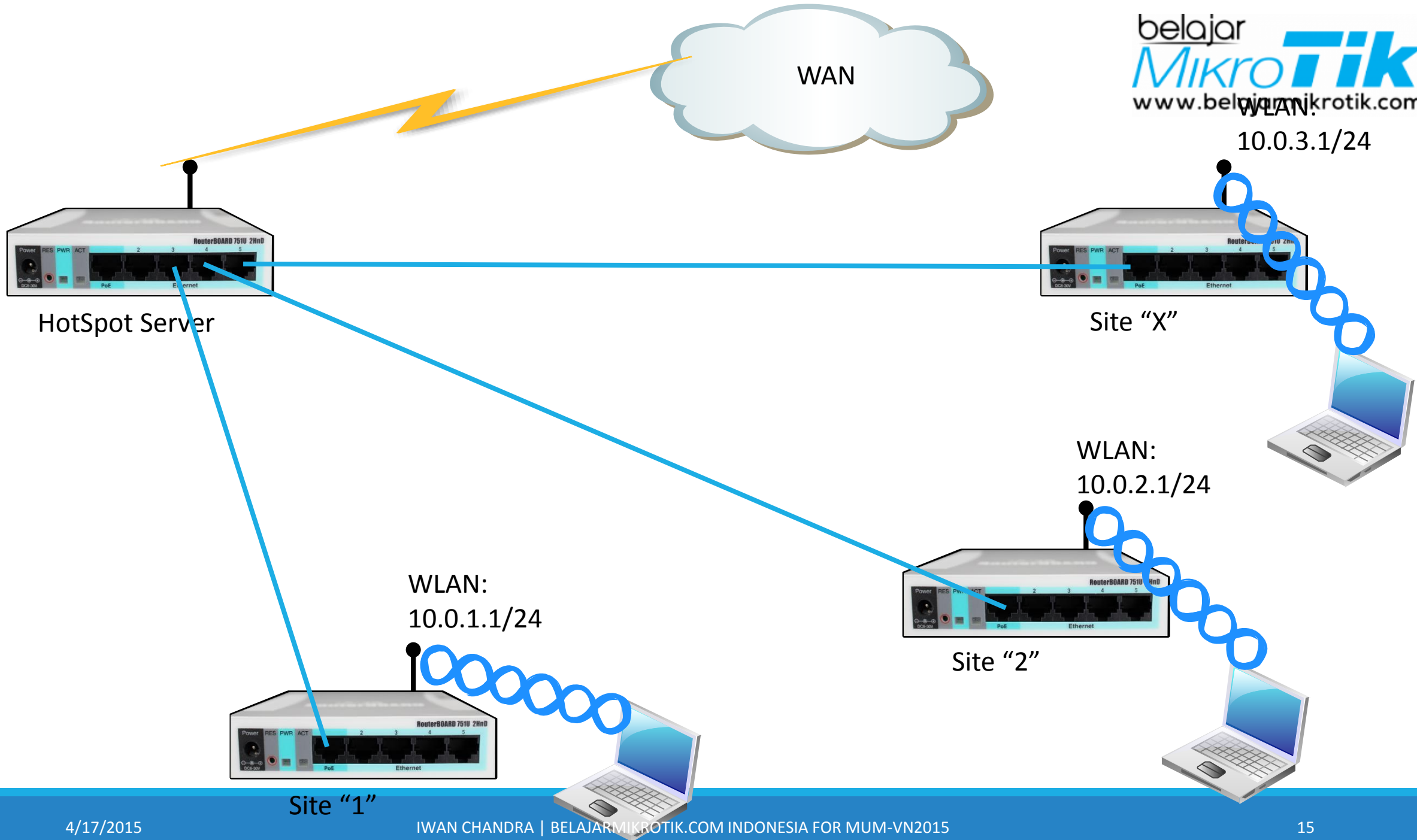


Allocate The Subnet

Divide the base network into subnets with smaller range







Then How We Distribute The Subnets?

DHCP Server

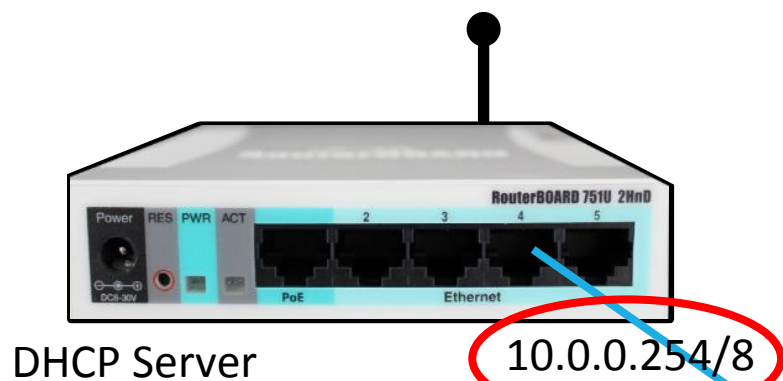
The Dynamic Host Configuration Protocol is used for dynamic distribution of network setting such as:

- IP address and netmask
- Default gateway address
- DNS and NTP server addresses

There can be only one DHCP server per interface/relay combination on the router

DHCP Relay

- DHCP Relay is just a proxy that is able to receive a DHCP discovery and request and resend them to the DHCP server
- There can be only one DHCP relay between DHCP server and DHCP client
- DHCP communication with relay does not require IP address on the relay, but relay's “local address” option must be the same with server's “relay address” option



DHCP Server

New DHCP Server

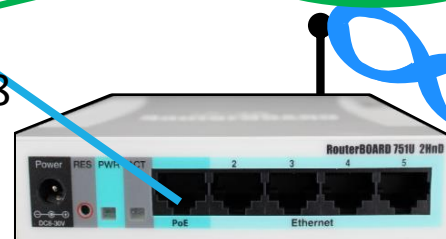
Name:

Interface:

Relay:

10.0.0.1/8

DHCP Relay



New DHCP Relay

General Status

Name:

Interface:

DHCP Server:

Delay Threshold:

Local Address:

10.0.1.1/24

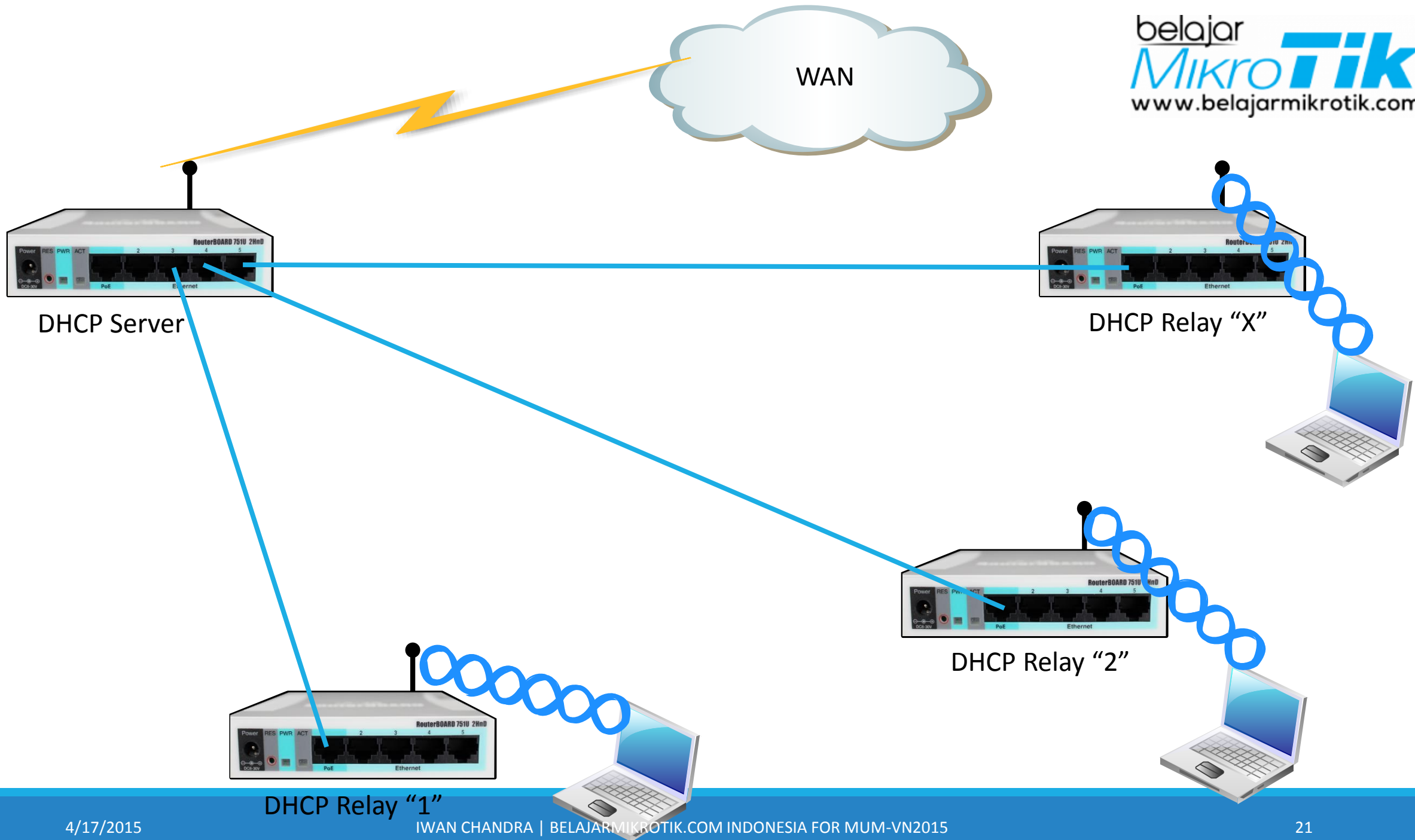
10.0.1.1



DHCP Client

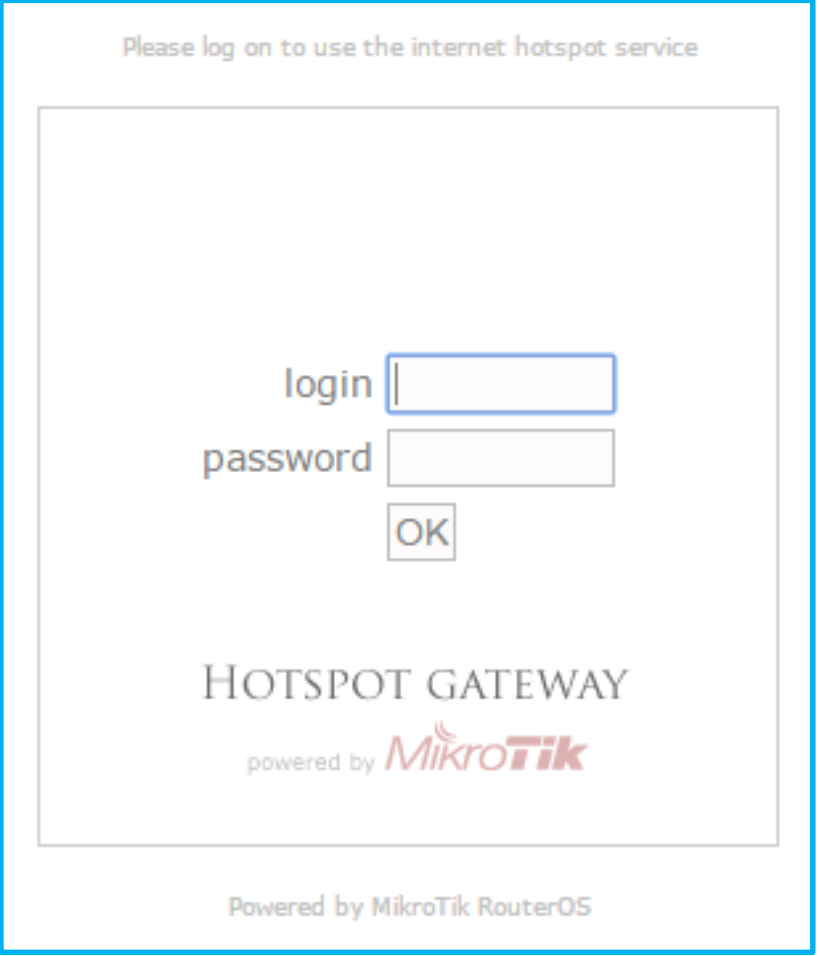
DHCP Assignment

- DHCP Relay will be use to distribute the smaller subnets to each allocated area
- The DHCP allocation still will be administered by DHCP Server
- DHCP Relay just facilitating the broadcast request between client and server



HotSpot

- Central Router will be administer the DHCP allocation, and the hotspot
- The Site Router will not used as HotSpot Server at all
- By default, hotspot server will show “hotspot/login.html” page which loaded from it’s directory.



Please log on to use the internet hotspot service

login

password

HOTSPOT GATEWAY

powered by **MikroTik**



Powered by MikroTik RouterOS

HotSpot Result

- Active HotSpot User will show different IP Address with IP Address from DHCP Server Lease
- It's normal, because HotSpot create different pool, aside from DHCP Server

Hotspot

Server ProfilesUsersUser ProfilesActiveHostsIP BindingsService PortsWalled GardenWalled Garden

Server	User	Domain	Address	Uptime	Idle Time	Session
 hotspot 1	test		10.255.255.250	00:00:16	00:00:00	
 hotspot 1	test		10.255.255.253	00:00:12	00:00:01	

DHCP Server

DHCPNetworksLeasesOptionsOption SetsAlerts

Check Status

	Addr...	MAC A...	Clie...	S...	Active Address	Active MAC Address	Active Host	Expires After
D					10.0.1.254	34:E2:FD:82:60:F6	RemPhone	00:08:53
D					10.0.2.252	34:51:C9:61:B8:73	NjemPad	00:09:28

HotSpot Page

This page can be customized by editing the login.html file

```
<table width="100%" style="margin-top: 10%;">
<tr>
<td align="center" valign="middle">
<div class="notice" style="color: #c1c1c1; font-size: 9px">Please log on to use the internet
<table width="280" height="280" style="border: 1px solid #cccccc; padding: 0px;" cellpadding="5">
<tr>
<td align="center" valign="bottom" height="175" colspan="2">
<form name="login" action="$(link-login-only)" method="post"
$(if chap-id) onSubmit="return doLogin()" $(endif)>
<input type="hidden" name="dst" value="$(link-orig)" />
<input type="hidden" name="popup" value="true" />

<table width="100" style="background-color: #ffffff">
<tr><td align="right">login</td>
<td><input style="width: 80px" name="username" type="text" value="" />
</tr>
<tr><td align="right">password</td>
<td><input style="width: 80px" name="password" type="password" value="" />
</tr>
<tr><td align="right">&nbsp;</td>
<td><input type="submit" value="OK" /></td>
</tr>
</table>
</td>
</tr>
</table>
<tr><td align="center"><a href="http://www.mikrotik.com" target="_blank" style="border: 1px solid #cccccc; padding: 2px; text-decoration: none; color: #c1c1c1;">Mikrotik</a>
</td>
</tr>
</table>
```

Source:

http://wiki.mikrotik.com/wiki/HotSpot_external_login_page

Customize “login.html”

The new “login.html” file will be redirected to other server outside the router

```
<body>
$(if chap-id)
<noscript>
<center><b>JavaScript required. Enable JavaScript to continue.</b></center>
</noscript>
$(endif)
```

```
<comment>If you are not redirected in a few seconds, click 'continue' below</comment>
<form name="redirect" action="http://xx.xx.xx.xx/login.php" method="post">
```

```
<input type="hidden" name="mac" value="$(mac)">
<input type="hidden" name="ip" value="$(ip)">
```

```
<input type="hidden" name="username" value="$(username)">
```

```
<input type="hidden" name="link-login" value="$(link-login)">
```

```
<input type="hidden" name="link-orig" value="$(link-orig)">
```

```
<input type="hidden" name="error" value="$(error)">
```

```
<input type="hidden" name="chap-id" value="$(chap-id)">
```

```
<input type="hidden" name="chap-challenge" value="$(chap-challenge)">
```

```
<input type="hidden" name="link-login-only" value="$(link-login-only)">
```

```
<input type="hidden" name="link-orig-esc" value="$(link-orig-esc)">
```

```
<input type="hidden" name="mac-esc" value="$(mac-esc)">
```

```
<input type="submit" value="continue">
```

```
</form>
```

Source:

http://wiki.mikrotik.com/wiki/HotSpot_external_login_page

New HotSpot Page

- The new page is still displaying the same page on each HotSpot Sites
- Because they refer to the same web server
- We need to send the request, to the different server

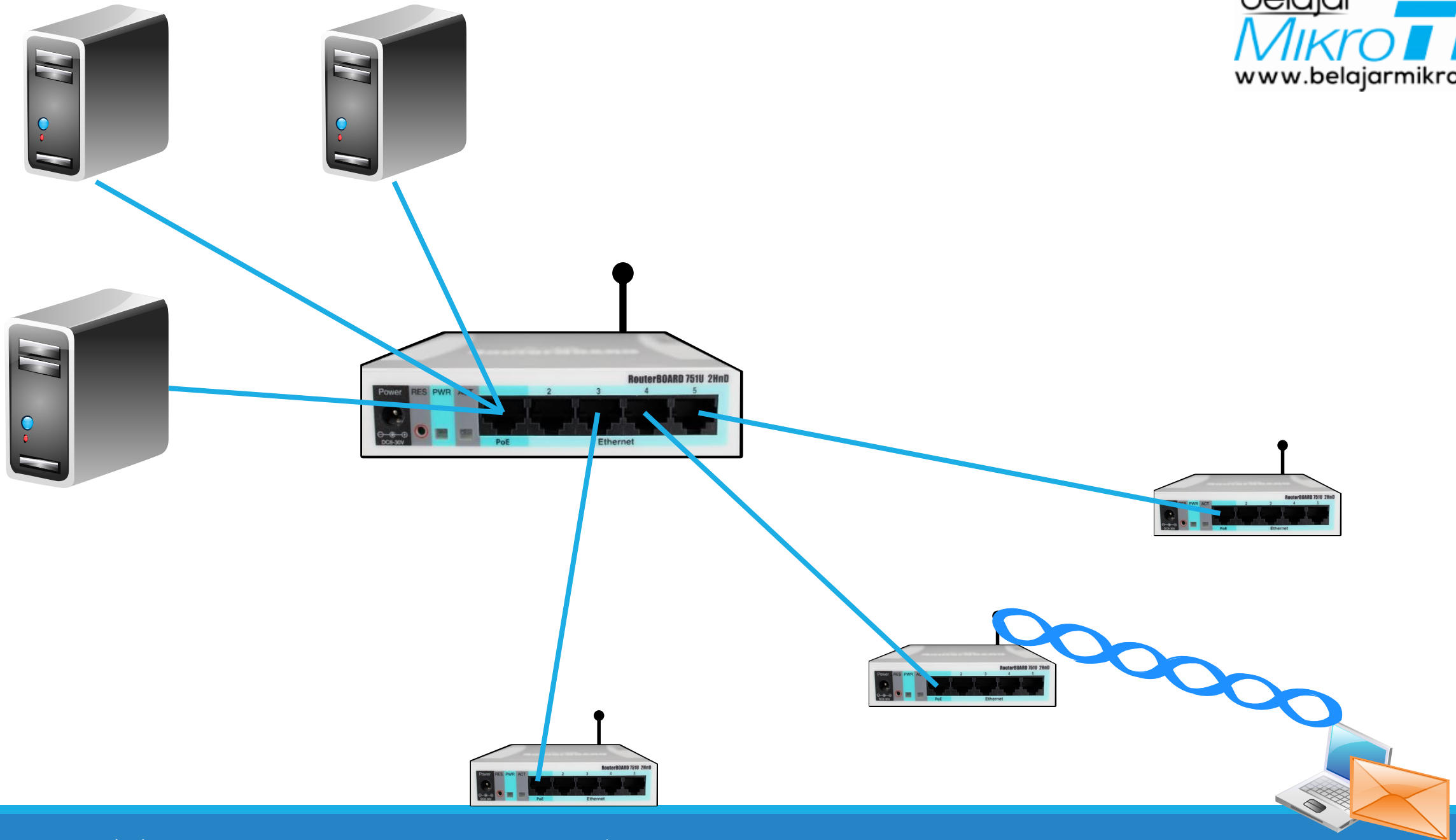
Network Address Translation

Used to change IP Address

There is two type of NAT:

- SRC-NAT, change source IP Address
- DST-NAT, change destination IP Address

We are using DST-NAT in this scenario



Set DST-NAT

- Create DST-NAT for destination address “192.168.8.126” on each area, by filtering the source Mac Address, to the desired server
- Don't forget to check your Area Connected Interface's Mac Address

```
/ip firewall nat add chain=dstnat  
dst-address=192.168.8.126  
protocol=tcp dst-port=80  
src-mac-address=<<area 1 router mac-address>>  
action=dst-nat to-addresses=192.168.8.131
```

Set DST-NAT

The image displays three overlapping screenshots of the Mikrotik WinBox interface, illustrating the steps to configure a Destination NAT (DST-NAT) rule. Red rectangles highlight the specific fields being modified in each step.

First Screenshot (Left): Shows the 'NAT Rule <192.168.8.126:80>' configuration window. The 'Chain' is set to 'dstnat'. The 'Dst. Address' field is highlighted with a red rectangle and contains '192.168.8.126'. The 'Protocol' dropdown is highlighted with a red rectangle and set to '6 (tcp)'. The 'Dst. Port' field is highlighted with a red rectangle and contains '80'.

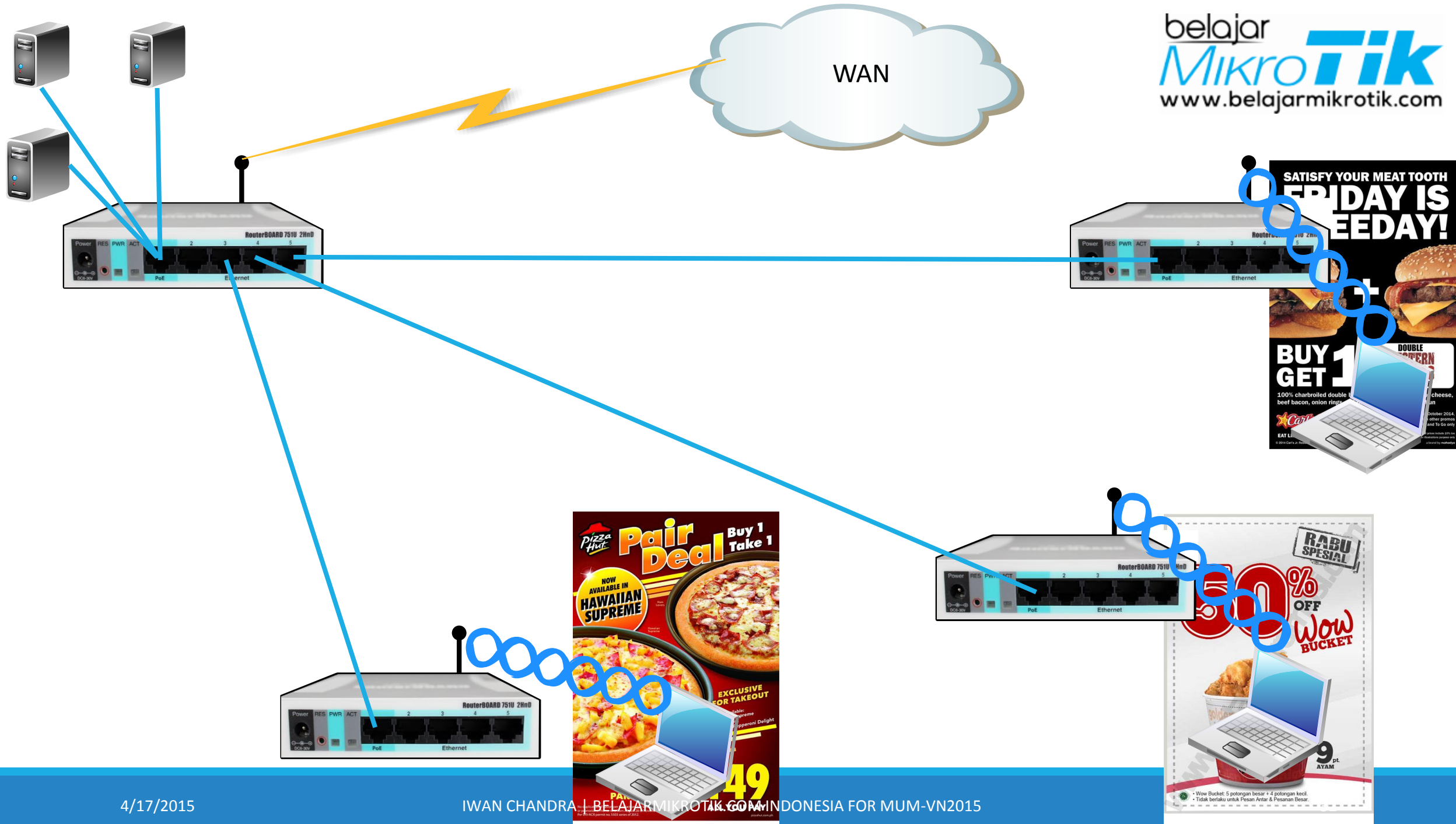
Second Screenshot (Middle): Shows the 'NAT Rule <192.168.8.126:80>' configuration window. The 'Src. Address List' field is highlighted with a red rectangle and is empty. The 'Dst. Address List' field is highlighted with a red rectangle and is empty. The 'Layer7 Protocol' field is highlighted with a red rectangle and is empty. The 'Content' field is highlighted with a red rectangle and is empty. The 'Connection Bytes' field is highlighted with a red rectangle and is empty. The 'Connection Rate' field is highlighted with a red rectangle and is empty. The 'Per Connection Classifier' field is highlighted with a red rectangle and is empty. The 'Src. MAC Address' field is highlighted with a red rectangle and contains 'D4:CA:6D:B3:8D:A9'.

Third Screenshot (Right): Shows the 'NAT Rule <192.168.8.126:80>' configuration window. The 'Action' dropdown is highlighted with a red rectangle and set to 'dst-nat'. The 'Log' checkbox is highlighted with a red rectangle and is unchecked. The 'Log Prefix' field is highlighted with a red rectangle and is empty. The 'To Addresses' field is highlighted with a red rectangle and contains '192.168.8.133'. The 'To Ports' field is highlighted with a red rectangle and is empty.

Web Server with PHP5

Webserver will catch the parameters which posted from the login.html using php variables, and then pass the input, back to the router

```
<?php
$mac=$_POST['mac'];
$ip=$_POST['ip'];
$username=$_POST['username'];
$linklogin=$_POST['link-login'];
$linkorig=$_POST['link-orig'];
$error=$_POST['error'];
$chapid=$_POST['chap-id'];
$chapchallenge=$_POST['chap-challenge'];
$linkloginonly=$_POST['link-login-only'];
$linkorigesc=$_POST['link-orig-esc'];
$macesc=$_POST['mac-esc'];
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html>
<head>
<title>mikrotik hotspot > login</title>
<meta http-equiv="Content-Type" content="text/html; charset=UTF-8" />
<meta http-equiv="pragma" content="no-cache" />
<meta http-equiv="expires" content="-1" />
```



Summary

- Use the subnet segmentation to differentiate the area
- DHCP Relay used to distribute the smaller subnet from main subnet
- Manipulate hotspot page dynamically by redirect the hotspot request to external web server

Q & A

IWAN CHANDRA

ICHAN@BELAJARMIKROTIK.COM

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