Hotspot over

BGP based VPLS network

By Paul Darius

About Presenter :

Paul Darius

- Founder & Owner Sky Networks Solusindo (2007)
- Introduced to MikroTik @ 2004 with RB230+R52
- MTCNA (2011), MTCTCE (2012), MTCUME (2013), MTCRE (2014), MTCINE (2014)

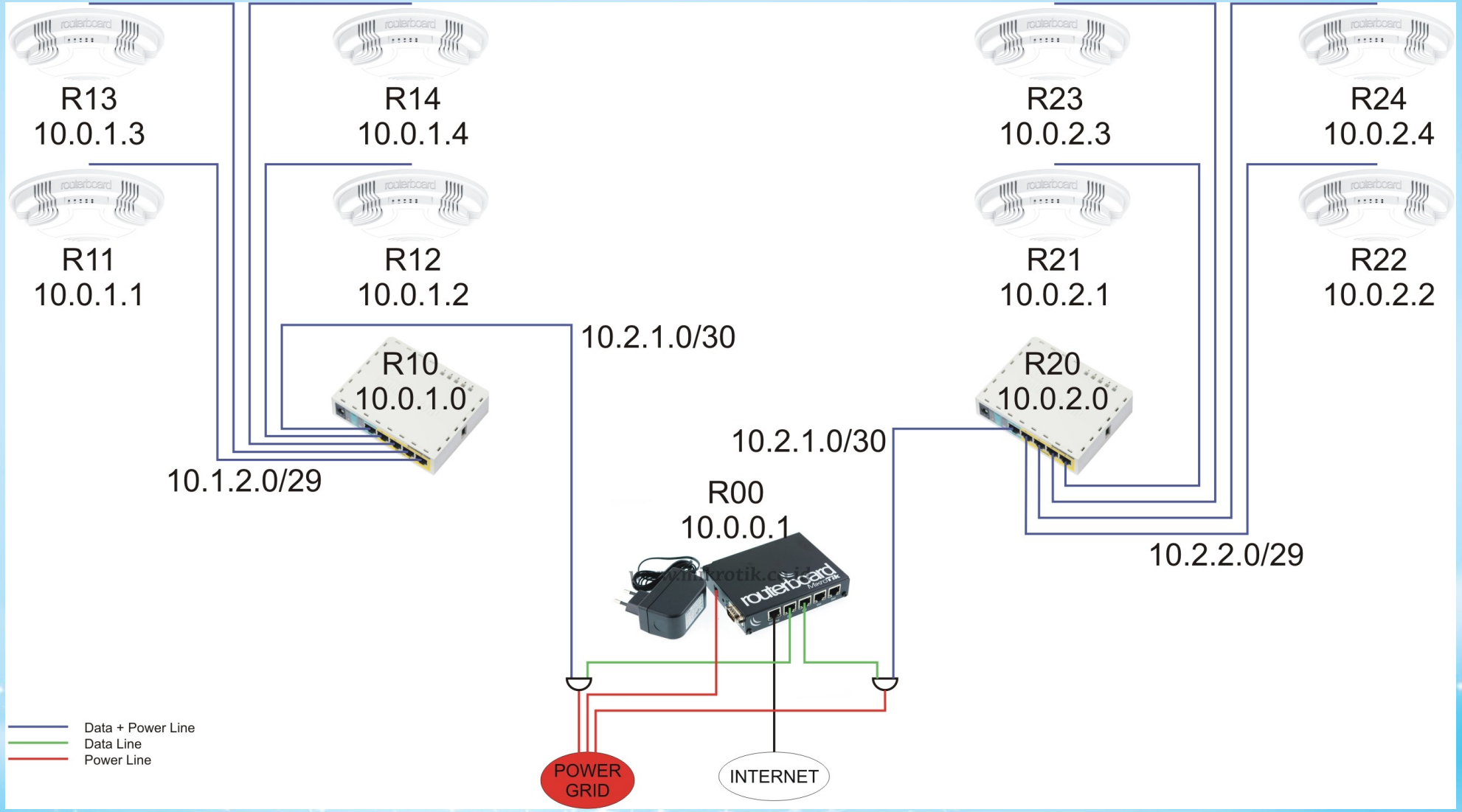
Overview

- Hotspot need at one small hotel; 2 building with 2 level each.
- This can be done with EoIP but having problem with mtu issue (packet fragmented).
- Due to the above of mtu issue, than we decide to use BGP based VPLS.

Hardware Used

- 1 unit RB850 with Power Adaptor
- 2 unit RB750UP with Power Adaptor
- 8 unit cAP 2n
- 2 unit PoE

Network Diagram



Presentation Note

The configuration shown will be concentrated on :

- **R00 as Main Router**
- **R10 as MPLS Router**
- **R11 as one of Distribution Router**
- **The configuration of other routers could be rely on this presentation with some alteration**

Router Configuration
step 1 – interface preparation

```
[admin@MikroTik] > /system identity set name=R00
[admin@R00] > /interface bridge add name=loopback
[admin@R00] > /interface bridge add name=hotspot
```

```
[admin@MikroTik] > /system identity set name=R10
[admin@R10] > /interface bridge add name=loopback
[admin@R10] > /interface ethernet set [ find default-name=ether3 ] master-port=ether2
[admin@R10] > /interface ethernet set [ find default-name=ether4 ] master-port=ether2
[admin@R10] > /interface ethernet set [ find default-name=ether5 ] master-port=ether2
```

```
[admin@MikroTik] > /system identity set name=R11
[admin@R11] > /interface bridge add name=loopback
[admin@R11] > /interface bridge add name=hotspot
[admin@R11] > /interface bridge port add bridge=hotspot interface=wlan1
[admin@R11] > /interface wireless set 0 band=2ghz-b/g/n frequency=2412 \
\... ht-ampdu-priorities= 0,1,2,3,4,5,6,7 ht-rxchains=0,1 ht-txchains=0,1 \
\... ssid="SKYnet" mode=ap-bridge wireless-protocol=any default-forwarding=no
```

Router Configuration
step 2 – ip configuration

```
[admin@R00] > /ip dhcp-client add interface=ether1 disabled=no
[admin@R00] > /ip address add address=10.0.0.1/32 interface=loopback
[admin@R00] > /ip address add address=10.1.1.1/30 interface=ether2
```

```
[admin@R10] > /ip address add address=10.0.1.0 interface=loopback
[admin@R10] > /ip address add address=10.1.1.2/30 interface=ether1
[admin@R10] > /ip address add address=10.1.2.1/29 interface=ether2
```

```
[admin@R11] > /ip address add address=10.0.1.1 interface=loopback
[admin@R11] > /ip address add address=10.1.2.2/29 interface=ether1
```

Router Configuration
step 3 – OSPF Configuration

```
[admin@R00] > /routing ospf network add area=backbone network=10.0.0.1/32
[admin@R00] > /routing ospf network add area=backbone network=10.1.1.0/30
```

```
[admin@R10] > /routing ospf network add area=backbone network=10.0.1.0/32
[admin@R10] > /routing ospf network add area=backbone network=10.1.1.0/30
[admin@R10] > /routing ospf network add area=backbone network=10.1.2.0/29
```

```
[admin@R11] > /routing ospf network add area=backbone network=10.0.1.1/32
[admin@R11] > /routing ospf network add area=backbone network=10.1.2.0/29
```

Router Configuration
step 4 – MPLS Configuration

```
[admin@R00] > /mpls ldp set enabled=yes lsr-id=10.0.0.1 transport-address=10.0.0.1
[admin@R00] > /mpls ldp interface add interface=ether2
```

```
[admin@R10] > /mpls ldp set enabled=yes lsr-id=10.0.1.0 transport-address=10.0.1.0
[admin@R10] > /mpls ldp interface add interface=ether1
[admin@R10] > /mpls ldp interface add interface=ether2
```

```
[admin@R11] > /mpls ldp set enabled=yes lsr-id=10.0.1.1 transport-address=10.0.1.1
[admin@R11] > /mpls ldp interface add interface=ether1
```

Router Configuration
step 5 – iBGP Configuration

```
[admin@R00] > /routing bgp peer add remote-address=10.0.1.1 remote-as=65530 \
\... address-families=l2vpn update-source=loopback
[admin@R00] > /routing bgp peer add remote-address=10.0.1.2 remote-as=65530 \
\... address-families=l2vpn update-source=loopback
[admin@R00] > /routing bgp peer add remote-address=10.0.1.3 remote-as=65530 \
\... address-families=l2vpn update-source=loopback
[admin@R00] > /routing bgp peer add remote-address=10.0.1.4 remote-as=65530 \
\... address-families=l2vpn update-source=loopback


[admin@R11] > /routing bgp peer add remote-address=10.0.0.1 remote-as=65530 \
\... address-families=l2vpn update-source=loopback
```

- **Where is R10 ?**
- **BGP only for end to end connectivity, so R10 does not need BGP configuration.**

Router Configuration
step 6 – BGP-VPLS Configuration

```
[admin@R00] > /interface vpls bgp-vpls add bridge=hotspot bridge-horizon=1 \
\... route-distinguisher=1:1 import-route-targets=1:1 \
\... export-route-targets=1:1 site-id=1
```

```
[admin@R11] > /interface vpls bgp-vpls add bridge=hotspot bridge-horizon=1 \
\... route-distinguisher=1:1 import-route-targets=1:1 \
\... export-route-targets=1:1 site-id=11
```

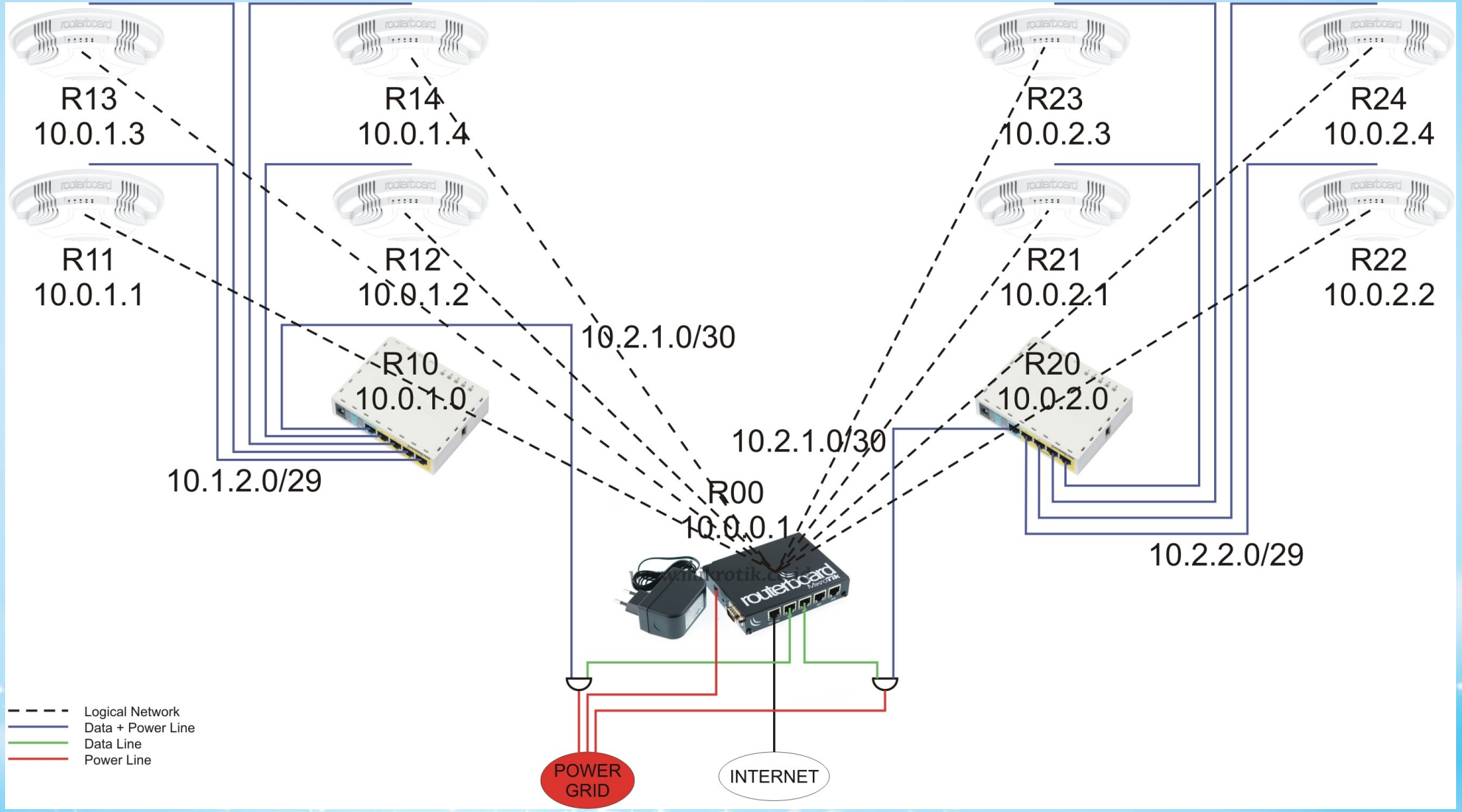
Ensure all VPLS are running (status at R00 for R11-R14)

```
[admin@R00] /interface vpls> print
Flags: X - disabled, R - running, D - dynamic, B - bgp-signaled, C - cisco-bgp-signaled
 0 RDB name="vpls1" mtu=1500 l2mtu=1500 mac-address=02:91:A0:DA:72:91 arp=enabled
       disable-running-check=no remote-peer=10.0.1.1 cisco-style=no cisco-style-id=0
       advertised-l2mtu=1500 pw-type=raw-ethernet use-control-word=yes vpls=bgp-vpls1

 1 RDB name="vpls2" mtu=1500 l2mtu=1500 mac-address=02:0E:B3:6C:97:21 arp=enabled
       disable-running-check=no remote-peer=10.0.1.2 cisco-style=no cisco-style-id=0
       advertised-l2mtu=1500 pw-type=raw-ethernet use-control-word=yes vpls=bgp-vpls1

 2 RDB name="vpls3" mtu=1500 l2mtu=1500 mac-address=02:8F:AC:30:7B:83 arp=enabled
       disable-running-check=no remote-peer=10.0.1.3 cisco-style=no cisco-style-id=0
       advertised-l2mtu=1500 pw-type=raw-ethernet use-control-word=yes vpls=bgp-vpls1

 3 RDB name="vpls4" mtu=1500 l2mtu=1500 mac-address=02:B0:32:0B:C5:41 arp=enabled
       disable-running-check=no remote-peer=10.0.1.4 cisco-style=no cisco-style-id=0
       advertised-l2mtu=1500 pw-type=raw-ethernet use-control-word=yes vpls=bgp-vpls1
[admin@R00] /interface vpls> _
```

Ensure all VPLS are running (status at R11 for R00)

```
[admin@R11] > interface vpls print
Flags: X - disabled, R - running, D - dynamic, B - bgp-signaled, C - cisco-bgp-signaled
 0 RDB name="vpls1" mtu=1500 l2mtu=1500 mac-address=02:92:7A:DD:85:D7 arp=enabled
       disable-running-check=no remote-peer=10.0.0.1 cisco-style=no cisco-style-id=0
       advertised-l2mtu=1500 pw-type=raw-ethernet use-control-word=yes vpls=bgp-vpls1
```

Logical Network Diagram



Lastly, for the hotspot

```
[admin@ROO] > /ip address add address=10.10.10.1/26 interface=hotspot
[admin@ROO] > /ip dns set allow-remote-requests=yes servers=180.131.144.144,180.131.145.145
[admin@ROO] > /ip firewall nat add chain=srcnat out-interface=ether1 action=masquerade
[admin@ROO] > /ip pool add name=hotspot ranges=10.10.10.2-10.10.10.62
[admin@ROO] > /ip dhcp-server network add address=10.10.10.0/26 dns-server=10.10.10.1 gateway=10.10.10.1
[admin@ROO] > /ip dhcp-server add name=hotspot address-pool=hotspot interface=hotspot lease-time=15m \
\... bootp-support=none add-arp=yes authoritative=yes disabled=no
[admin@ROO] > /ip hotspot profile set default login-by=http-chap,http-pap \
\... radius-default-domain=hotspot split-user-domain=yes use-radius=yes
[admin@ROO] > /ip hotspot add address-pool=hotspot interface=hotspot name=hotspot profile=default disabled=no
[admin@ROO] > /ip hotspot user profile set default idle-timeout=5m keepalive-timeout=2m \
\... shared-users=1 incoming-packet-mark=DEFAULT-UP outgoing-packet-mark=DEFAULT-DOWN \
\... status-autorefresh=1m transparent-proxy=yes
[admin@ROO] > /ip hotspot user add server=hotspot name=test password=test
[admin@ROO] > /ip hotspot walled-garden ip add action=accept comment="" disabled=no dst-address=10.0.0.0/23
[admin@ROO] > /ip hotspot walled-garden ip add action=accept comment="" disabled=no dst-address=10.10.10.0/26
```

Result at of all end-point

Conclution

- This presentation is an example of running hotspot on top of BGP based VPLS.
- Incase the customer need to add more router for hotspot coverage, the setting of the new router will only OSPF, MPLS and BGP-VPLS. Does need to touch the same setting on main router.
- For bigger network, we can run other services such as PPPoE or others as replacement of hotspot.
- For security reason, it advisible to disable Network Discovery on all of the routers.

Suggestion and or Question ?

Thank you for watching this presentation.

For any other further enquiry, please email to :

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