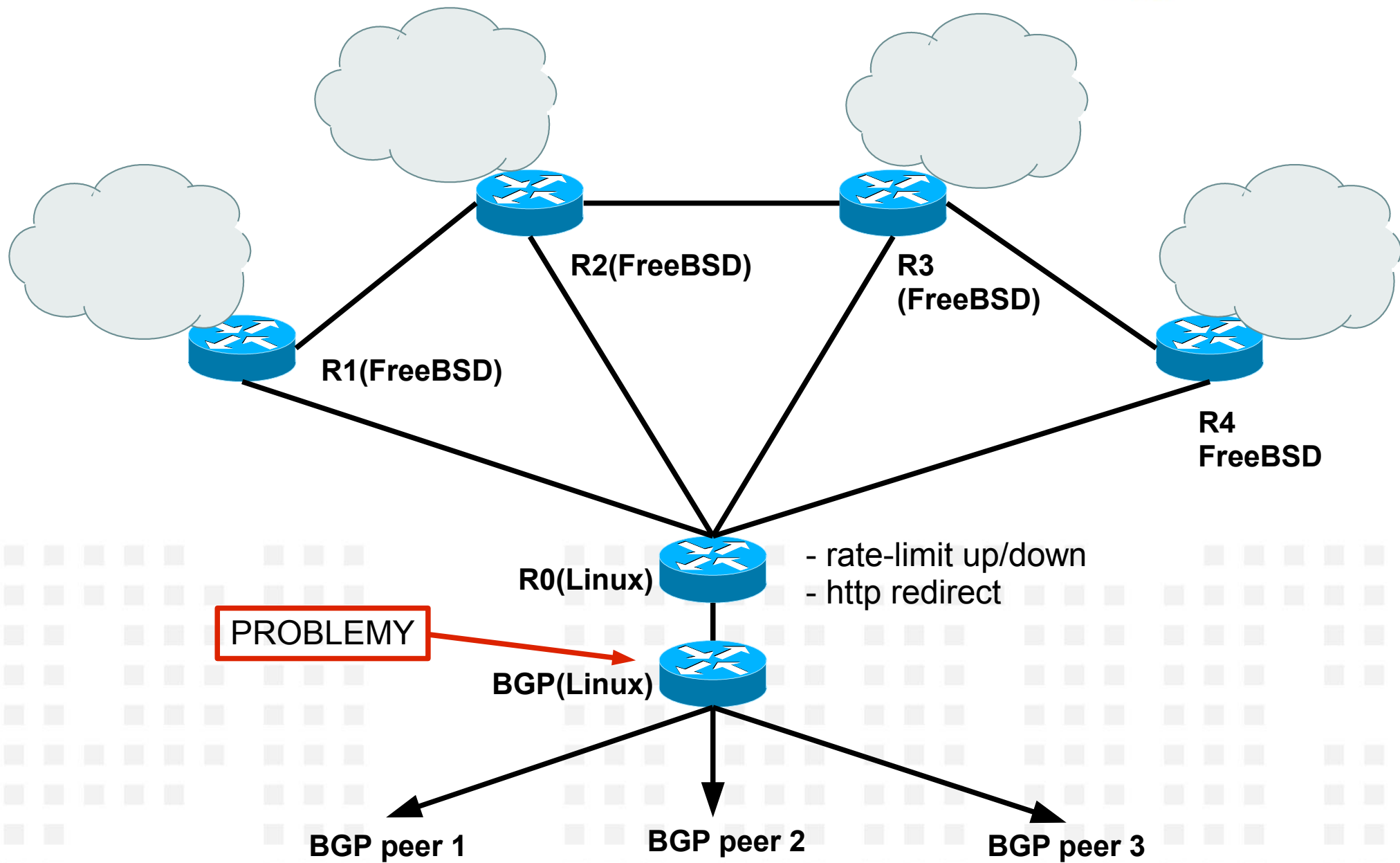


# Jak wyrzuciliśmy wszystkie Linuxy, czyli centralny BRAS u lokalnego dostawcy ISP

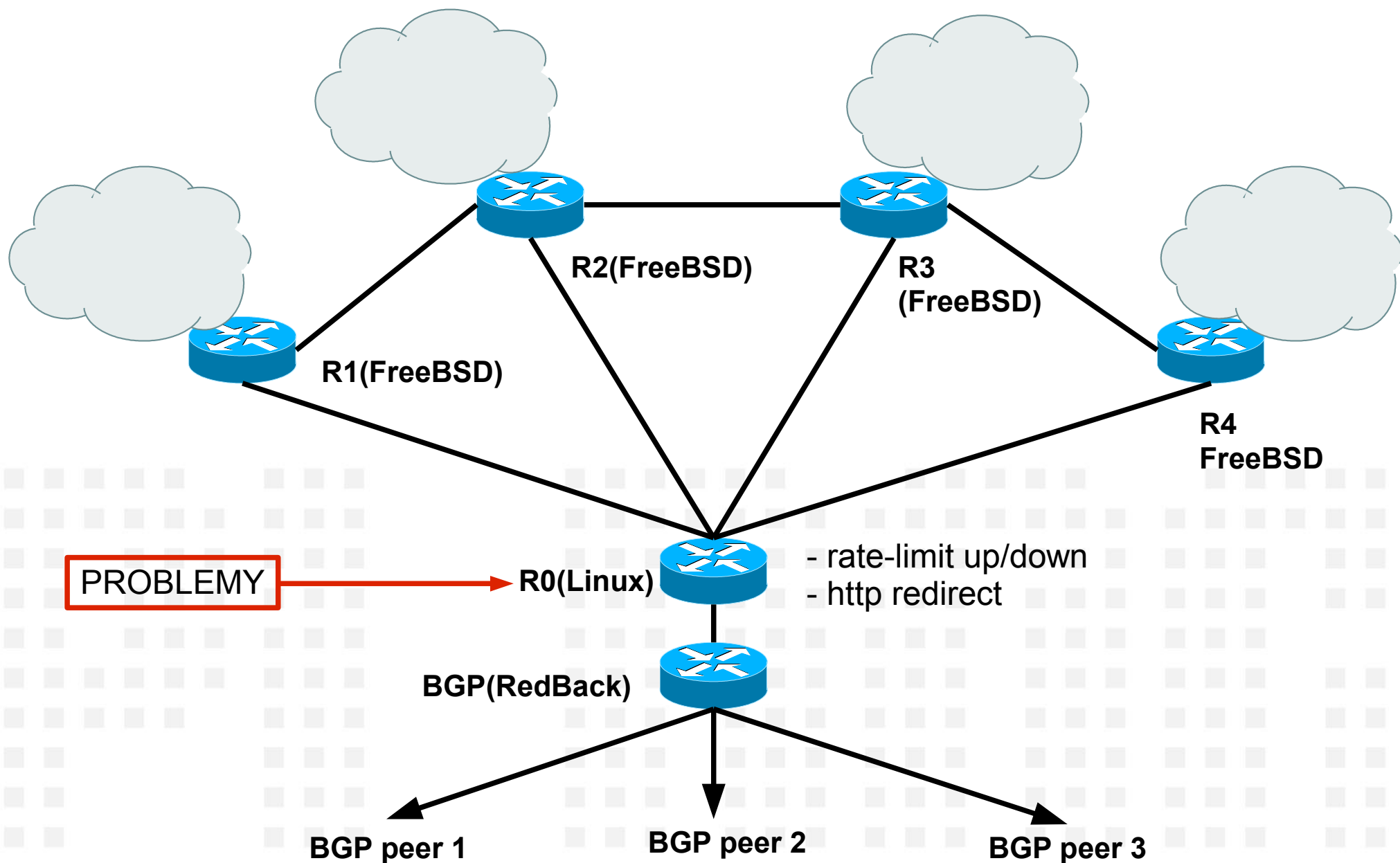
- coś o mnie
- dlaczego właśnie ten temat

# Pierwotna struktura sieci



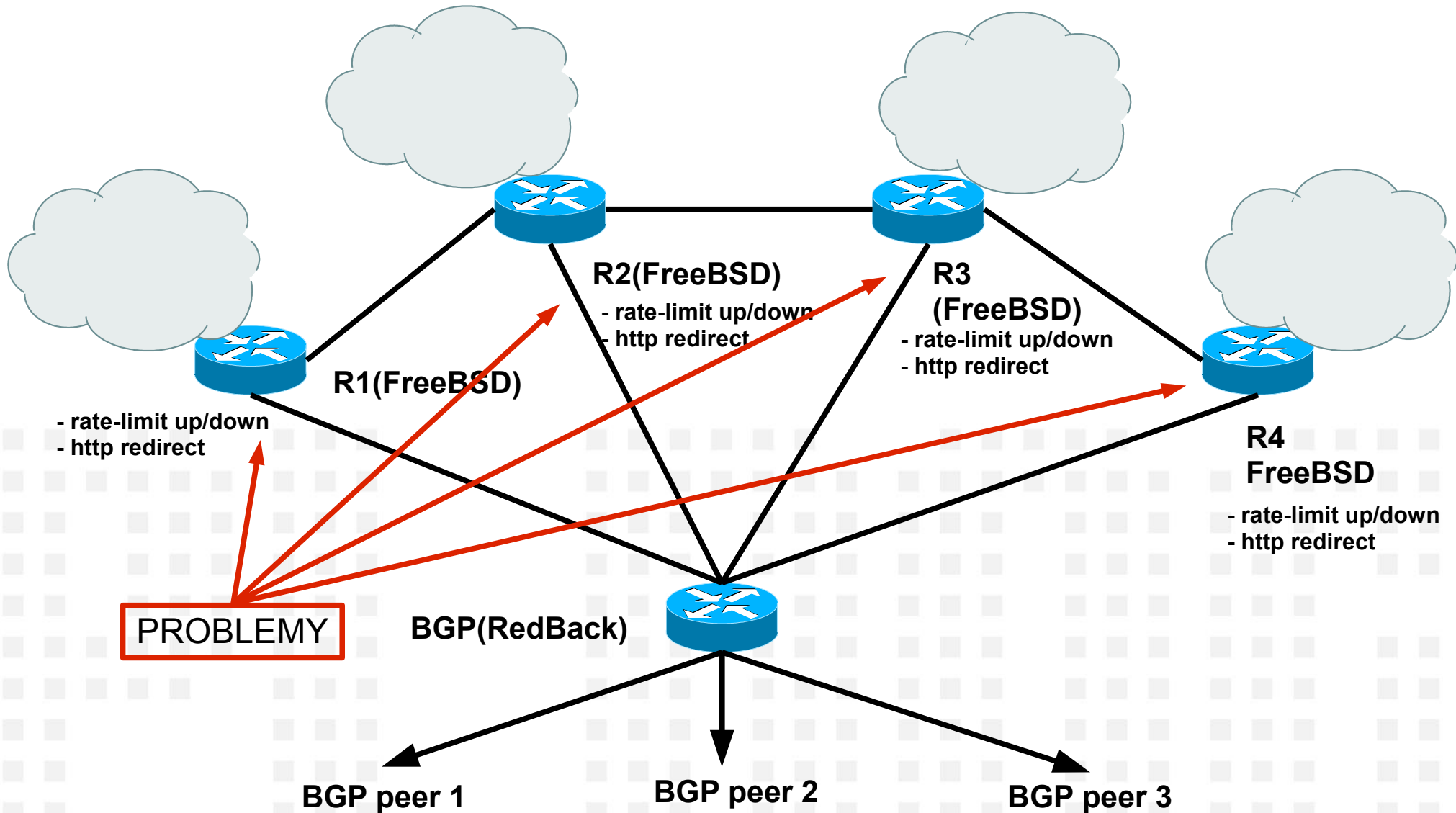
# Pierwszy krok modyfikacji

## wymiana routera BGP



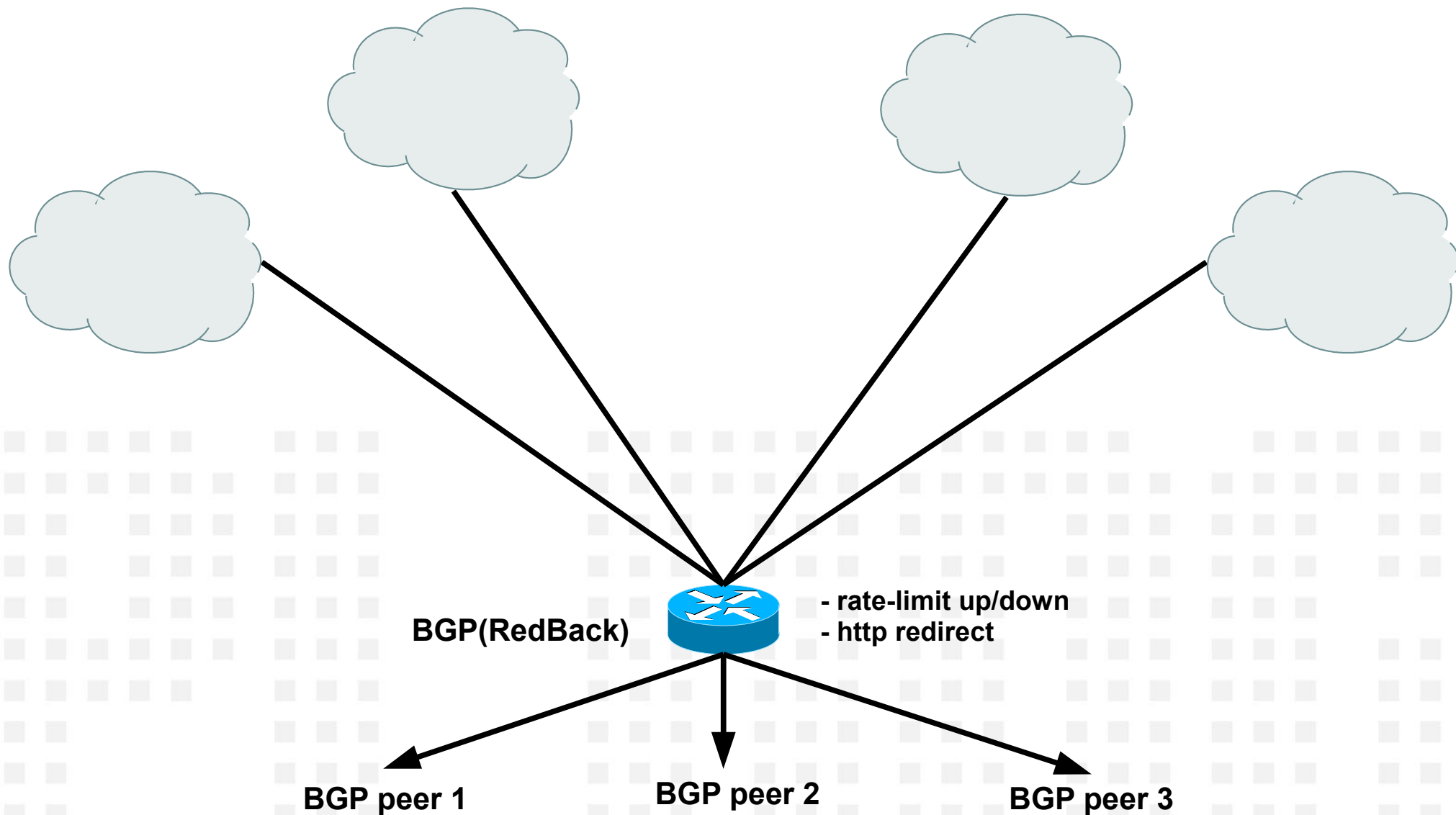
# Drugi krok modyfikacji

Kolejkowanie na routerach dostępowych

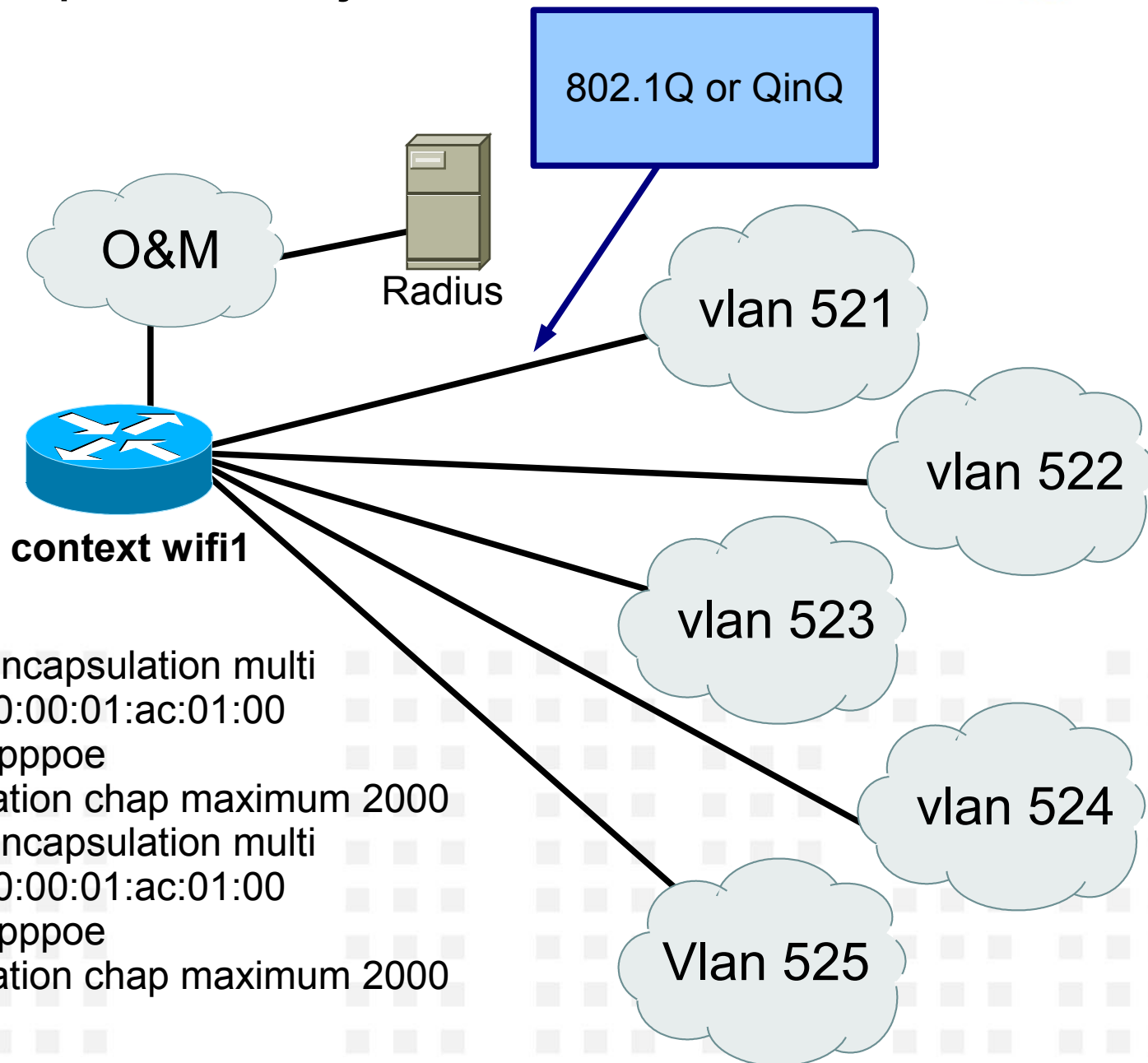


# “Last” step of modification

Usunięcie routerów dostępowych



# PPPoE - implementacja



```
port ethernet 2/3
dot1q pvc 521 encapsulation multi
mac-address 00:00:01:ac:01:00
circuit protocol pppoe
bind authentication chap maximum 2000
dot1q pvc 522 encapsulation multi
mac-address 00:00:01:ac:01:00
circuit protocol pppoe
bind authentication chap maximum 2000
```

# PPPoE implmentacja - cont.

```
[local]RedBack_SE100#context wifi1
[wifi1]RedBack_SE100#show config
Building configuration...
```

Current configuration:

```
!
context wifi1
 domain wifi advertise
!
```

```
...
[wifi1]RedBack_SE100#context voip1
[voip1]RedBack_SE100#show config
Building configuration...
```

Current configuration:

```
!
context voip1
 domain voip advertise
!
```

```
...
[voip1]RedBack_SE100#context sgt-tv
[sgt-tv]RedBack_SE100#show config
Building configuration...
```

Current configuration:

```
!
context sgt-tv
!
```

```
!
...
```

```
[voip1]RedBack_SE100#context local
[local]RedBack_SE100#show config
```

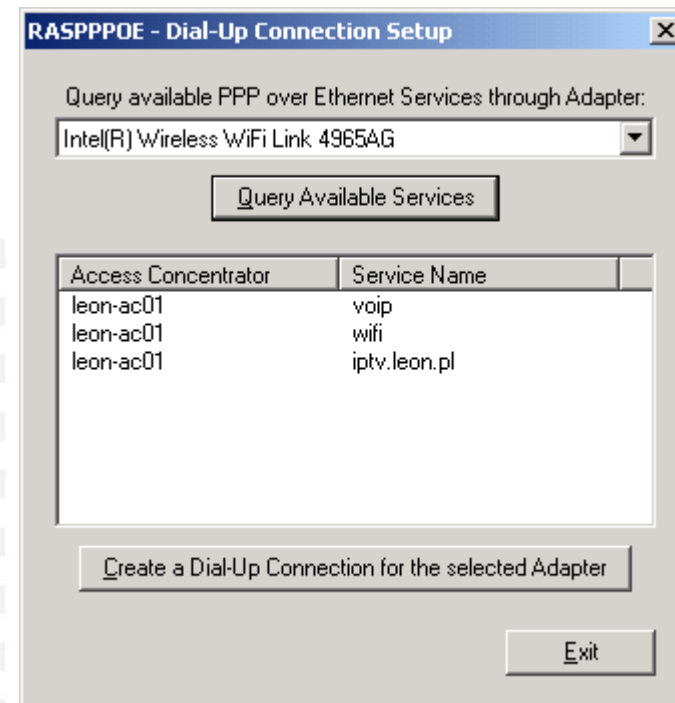
```
!
```

```
...
!
```

```
pppoe services marked-domains
pppoe tag ac-name leon-ac01
pppoe always-send-padt
```

```
!
```

```
...
```



# PPPoE implementacja - cont.



```
[wifi1]RedBack_SE100#show pppoe
```

```
Mon Mar 1 17:41:43 2010
```

Circuit	MAC address	Subscriber
2/3 vlan-id 522 pppoe 1237	00:0e:8e:1e:c1:f4	RADIO_002181@wifi
2/3 vlan-id 522 pppoe 12164	00:0e:8e:19:b6:0f	RADIO_001546@wifi
2/3 vlan-id 510 pppoe 521	00:aa:ab:02:08:07	RADIO_002741@wifi
2/3 vlan-id 522 pppoe 755	00:0c:42:2c:4b:18	RADIO_002143@wifi
2/3 vlan-id 521 pppoe 11848	00:0e:8e:1e:6d:cc	RADIO_001898@wifi
2/3 vlan-id 522 pppoe 643	00:aa:ab:02:04:f3	RADIO_002908@wifi
...		
2/3 vlan-id 521 pppoe 18073	00:0e:8e:22:ed:a0	RADIO_002440@wifi
2/3 vlan-id 522 pppoe 18195	00:0e:8e:19:4d:44	RADIO_001488@wifi
2/3 vlan-id 522 pppoe 18215	00:aa:ab:02:07:6c	RADIO_002641@wifi
2/3 vlan-id 522 pppoe 17707	00:0e:8e:1f:60:dc	RADIO_002303@wifi

# PPPoE implementacja - cont.



```
[wifi1]RedBack_SE100#show subscribers
```

TYPE	CIRCUIT	SUBSCRIBER	CONTEXT	START TIME
pppoe	2/3 vlan-id 522	pppoe 1237 RADIO_002181@wifi	wifi1	Feb 26 21:26:24
pppoe	2/3 vlan-id 522	pppoe 1216 RADIO_001546@wifi	wifi1	Mar 1 06:17:47
pppoe	2/3 vlan-id 522	pppoe 643 RADIO_002908@wifi	wifi1	Mar 1 09:53:34
pppoe	2/3 vlan-id 522	pppoe 6765 RADIO_001893@wifi	wifi1	Mar 1 16:33:43
pppoe	2/3 vlan-id 525	pppoe 9846 RADIO_002726@wifi	wifi1	Feb 28 19:10:54
...				
pppoe	2/3 vlan-id 525	pppoe 1795 RADIO_002041@wifi	wifi1	Mar 1 15:18:11
pppoe	2/3 vlan-id 522	pppoe 1821 RADIO_002641@wifi	wifi1	Mar 1 17:37:48
pppoe	2/3 vlan-id 522	pppoe 1770 RADIO_002303@wifi	wifi1	Mar 1 17:38:27
pppoe	2/3 vlan-id 521	pppoe 1786 RADIO_000363@wifi	wifi1	Mar 1 17:44:00
pppoe	2/3 vlan-id 510	pppoe 1822 RADIO_002637@wifi	wifi1	Mar 1 17:44:18

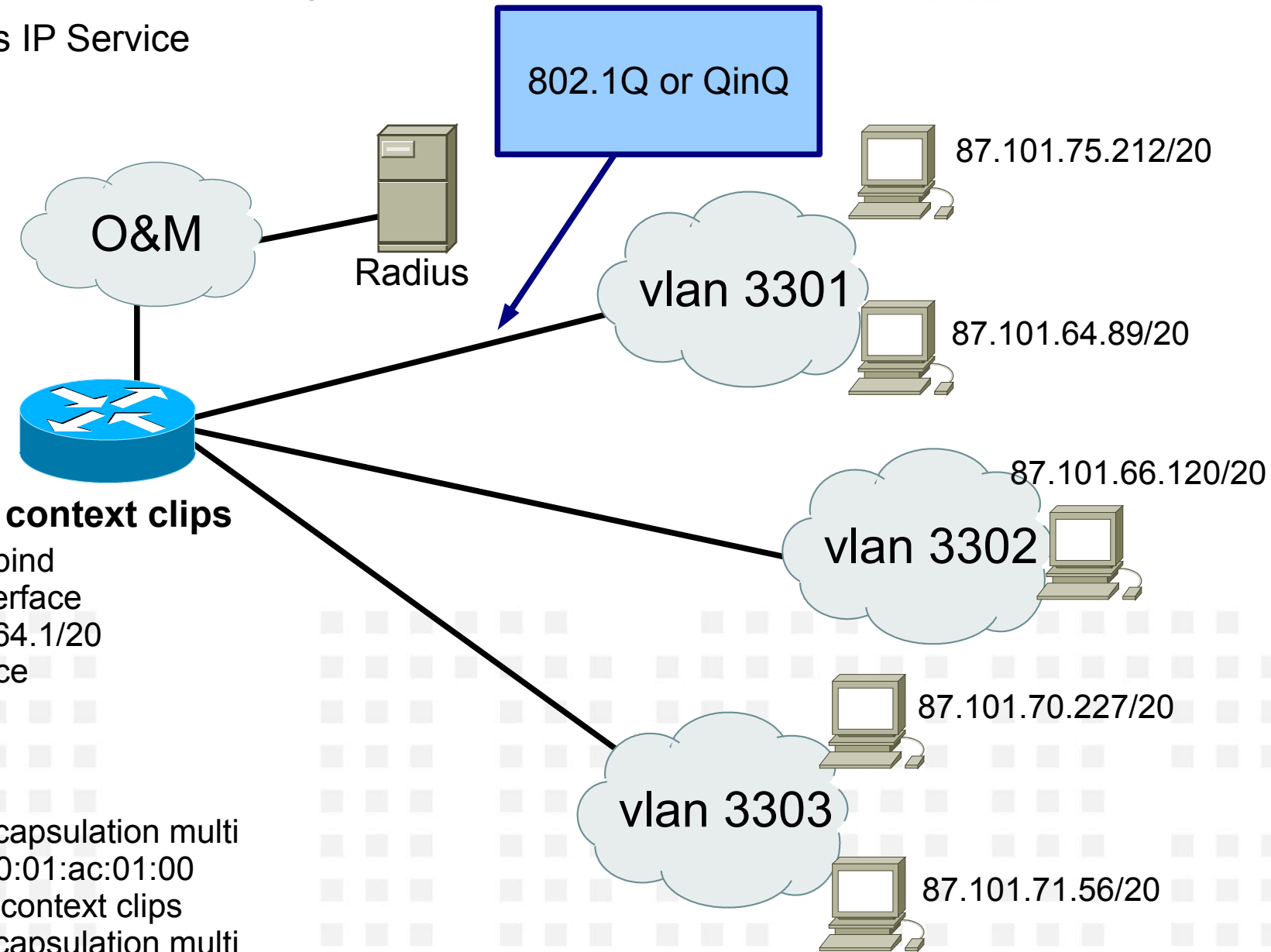
# PPPoE implementacja - cont.



```
[wifi1]RedBack_SE100#show subscribers active
RADIO_002181@wifi
  Circuit 2/3 vlan-id 522 pppoe 1237
  Internal Circuit 2/3:1023:63/6/2/129
  Interface bound pool
  Current port-limit 1
  profile wifi-standard (applied)
  context-name wifi1 (applied)
  ppp mtu 1480 (applied)
  ip address 89.200.225.148 (applied)
  port-limit 1 (applied from sub_default)
  ip source-validation 1 (applied from sub_default)
  dns primary 195.66.73.2 (applied from sub_default)
  dns secondary 195.66.73.11 (applied from sub_default)
  session-limit by agent-remote-id 1 (applied from sub_default)
  qos-policing-policy pppoe-wifi-standard-in (applied)
  qos-metering-policy pppoe-wifi-standard-out (applied)
  qos rate inbound rate 512 burst 128000 (applied from sub_profile)
  qos rate outbound rate 1024 burst 256000 (applied from sub_profile)
  forward policy in PPPoE-Default (applied from sub_default)
```

# CLIPS implementatacja

## ClientLess IP Service



```
interface clips multibind
description GW interface
ip address 87.101.64.1/20
dhcp server interface
ip arp proxy-arp
```

```
port ethernet 2/3
dot1q pvc 3301 encapsulation multi
mac-address 00:00:01:ac:01:00
service clips dhcp context clips
dot1q pvc 3302 encapsulation multi
mac-address 00:00:01:ac:01:00
service clips dhcp context clips
```

# CLIPS implementation cont.



```
[local]RedBack_SE100#context clips
```

```
[clips]RedBack_SE100#show clips
```

Circuit	IpAddr	Username
2/4 vlan-id 3001 clips 172096	87.101.64.76	00:50:fc:7a:14:4e
2/4 vlan-id 1117 clips 252002	87.101.75.212	00:1d:7e:e3:66:8d
2/4 vlan-id 3314 clips 180006	91.200.27.98	00:16:17:45:bf:4e
2/4 vlan-id 3002 clips 178132	87.101.66.124	00:1c:f0:7d:e2:8f
2/4 vlan-id 3308 clips 180726	91.200.26.34	00:16:e6:6d:b2:ee
2/4 vlan-id 3020 clips 182225	87.101.65.68	00:24:1d:a9:0d:07
2/4 vlan-id 2122 clips 180886	87.101.67.150	00:0f:ea:e2:45:57
2/4 vlan-id 3001 clips 180046	87.101.64.196	00:30:4f:25:2d:14
2/4 vlan-id 3302 clips 180509	91.200.24.105	00:e0:4c:5b:a5:f8
2/4 vlan-id 3024 clips 148227	193.93.92.231	00:e0:4c:12:06:de
2/4 vlan-id 3313 clips 178796	91.200.27.251	00:0b:6a:93:45:11
2/4 vlan-id 3002 clips 177500	87.101.65.97	00:05:5d:48:1c:d7
2/4 vlan-id 13 clips 182664	87.101.67.103	00:04:61:4d:1b:71
2/4 vlan-id 3028 clips 180310	87.101.77.247	00:19:66:38:4c:56
2/4 vlan-id 3302 clips 250595	91.200.24.198	00:30:4f:3b:2d:d3
...		
2/4 vlan-id 3019 clips 181084	87.101.64.169	00:14:85:f1:27:86
2/4 vlan-id 3205 clips 177478	87.101.74.11	00:20:4a:a3:eb:53
2/4 vlan-id 3012 clips 173509	87.101.69.61	00:02:44:5c:e8:3f

```
[clips]RedBack_SE100#
```

# CLIPS implementatacja - cont.



```
[clips]RedBack_SE100#show subscribers
```

```
TYPE      CIRCUIT          SUBSCRIBER          CONTEXT  START TIME
```

```
-----  
clips 2/4 vlan-id 3001 clips 172 00:50:fc:7a:14:4e clips Mar 2 23:25:41  
clips 2/4 vlan-id 1117 clips 252 00:1d:7e:e3:66:8d clips Feb 23 13:14:23  
clips 2/4 vlan-id 3314 clips 180 00:16:17:45:bf:4e clips Mar 2 23:04:00  
clips 2/4 vlan-id 3002 clips 178 00:1c:f0:7d:e2:8f clips Mar 2 11:56:12  
clips 2/4 vlan-id 3308 clips 180 00:16:e6:6d:b2:ee clips Mar 2 21:05:48  
clips 2/4 vlan-id 3020 clips 182 00:24:1d:a9:0d:07 clips Mar 2 16:03:08  
clips 2/4 vlan-id 2122 clips 180 00:0f:ea:e2:45:57 clips Mar 2 13:07:44  
clips 2/4 vlan-id 3002 clips 177 00:05:5d:48:1c:d7 clips Mar 2 11:33:19  
...  
clips 2/4 vlan-id 3019 clips 181 00:14:85:f1:27:86 clips Mar 2 19:39:20  
clips 2/4 vlan-id 3205 clips 177 00:20:4a:a3:eb:53 clips Mar 2 19:39:22  
clips 2/4 vlan-id 3012 clips 173 00:02:44:5c:e8:3f clips Mar 1 19:16:46  
-----
```

# CLIPS implementacja - cont.



```
[clips]RedBack_SE100#show subscribers active username 00:02:44:5c:e8:3f
00:02:44:5c:e8:3f
```

```
  Circuit  2/4 vlan-id 3012 clips 173509
```

```
  Internal Circuit  2/4:1023:63/7/2/68118
```

```
  Interface bound clips
```

```
  Current port-limit unlimited
```

```
  profile standard (applied)
```

```
  context-name clips (applied)
```

```
  dhcp max-addr 1 (applied)
```

```
  ip address 87.101.69.61 (applied)
```

```
  ip source-validation 1 (applied from sub_default)
```

```
  dns primary 195.66.73.2 (applied from sub_default)
```

```
  dns secondary 195.66.73.11 (applied from sub_default)
```

```
  dhcp vendor class id MSFT 98 (applied)
```

```
  dhcp option client id 0x3d07010002445ce83f (applied)
```

```
  dhcp option hostname 0x0c09544c2d575233343047 (applied)
```

```
  forward policy in clips-Default (applied from sub_default)
```

```
  qos-policing-policy clips-standard-in-noc (applied)
```

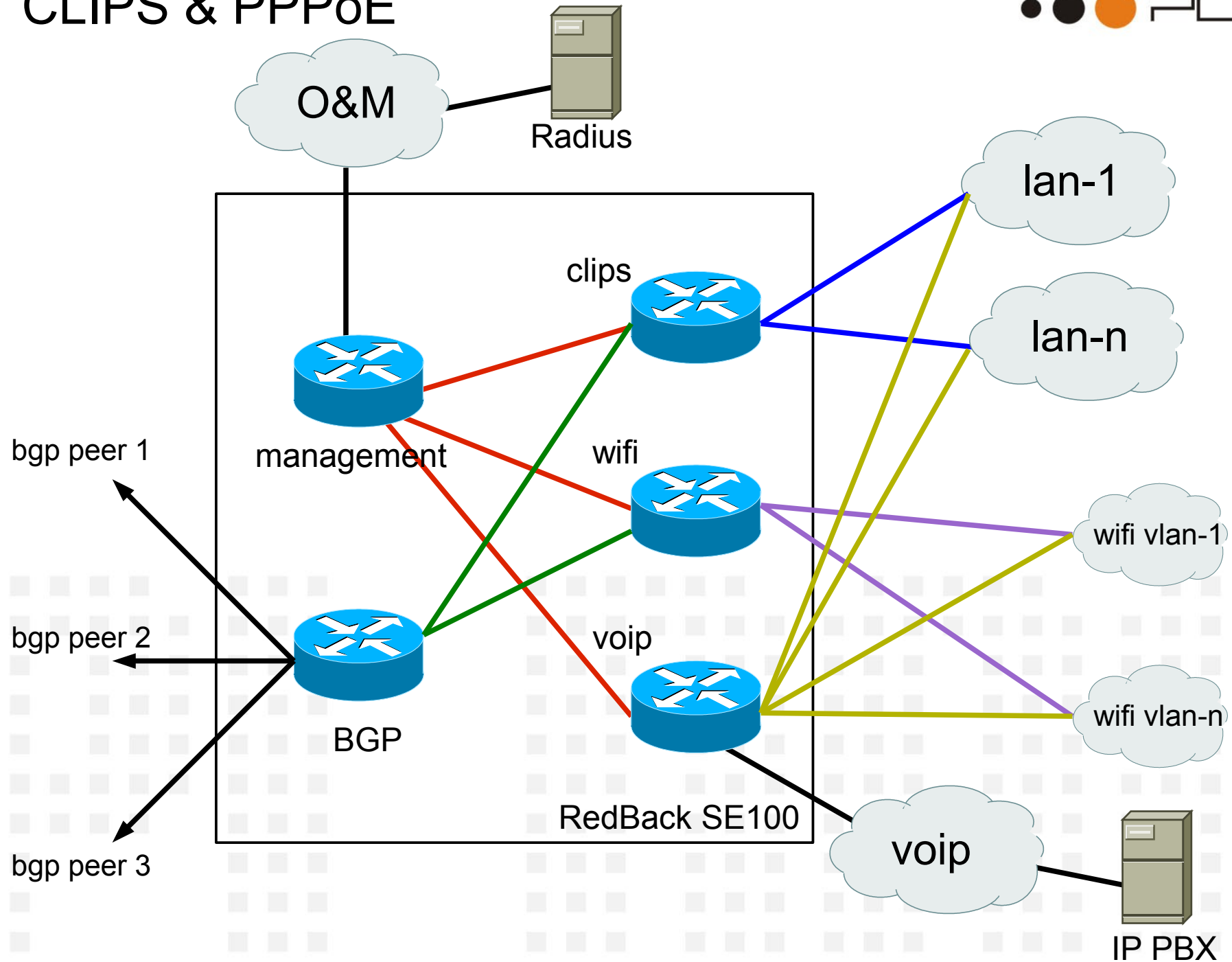
```
  qos-metering-policy clips-standard-out-noc (applied)
```

```
  IP host entries installed by DHCP: (max_addr 1 cur_entries 1)
```

```
    87.101.69.61  00:02:44:5c:e8:3f
```

```
[clips]RedBack_SE100#
```

# CLIPS & PPPoE



# CLIPS & PPPoE



```
# regular DHCP + PPPoE
```

```
!
```

```
port ethernet 2/3
```

```
encapsulation dot1q
```

```
dot1q pvc 5 encapsulation multi
```

```
bind interface vlan5 bgp1
```

```
circuit protocol pppoe
```

```
bind authentication chap maximum 100
```

```
!
```

```
# CLIPS (DHCP) + PPPoE
```

```
!
```

```
port ethernet 2/3
```

```
encapsulation dot1q
```

```
dot1q pvc 10 encapsulation multi
```

```
service clips dhcp context clips
```

```
circuit protocol pppoe
```

```
bind authentication chap maximum 100
```

```
!
```

# Zalety / Wady

## Zalety:

- centralny, bardzo wydajny koncentrator dostępowy
  - separacja pomiędzy vlanami - PPPoE
  - separacja pomiędzy vlanami/klientami CLIPS
  - oszczędność adresów IP w CLIPS
  - obsługa DHCP przez RADIUSa
  - jeden centralny punkt zarządzania abonentami
  - możliwość kreowania wielu serwisów z jednego punktu (voip, internet, tv)
  - możliwość terminacji L2TP (ADSL)
  - personifikacja komunikatów (przekierowania)
  - Radius Accounting – logowanie na potrzeby służb specjalnych
  - Lawfull Interception – przechwytywanie na potrzeby służb specjalnych
- 
- niewielkie rozmiary, niewielki pobór energii
  - zredukowane koszty operacyjne

## Wady:

- centralny punkt awarii...
  - wymaga bardzo dobrej sieci L2 (pojemność adresów MAC)
  - problemy z bramkami VOIP - Linksys (PAP2 oraz Telefony)
  - BRAS L3.. (coś jak ellacoya)
  - IPv6 – jeszcze nie działa
- 
- nie jest tak elastyczny jak LINUX/BSD

W przypadku pytań:

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