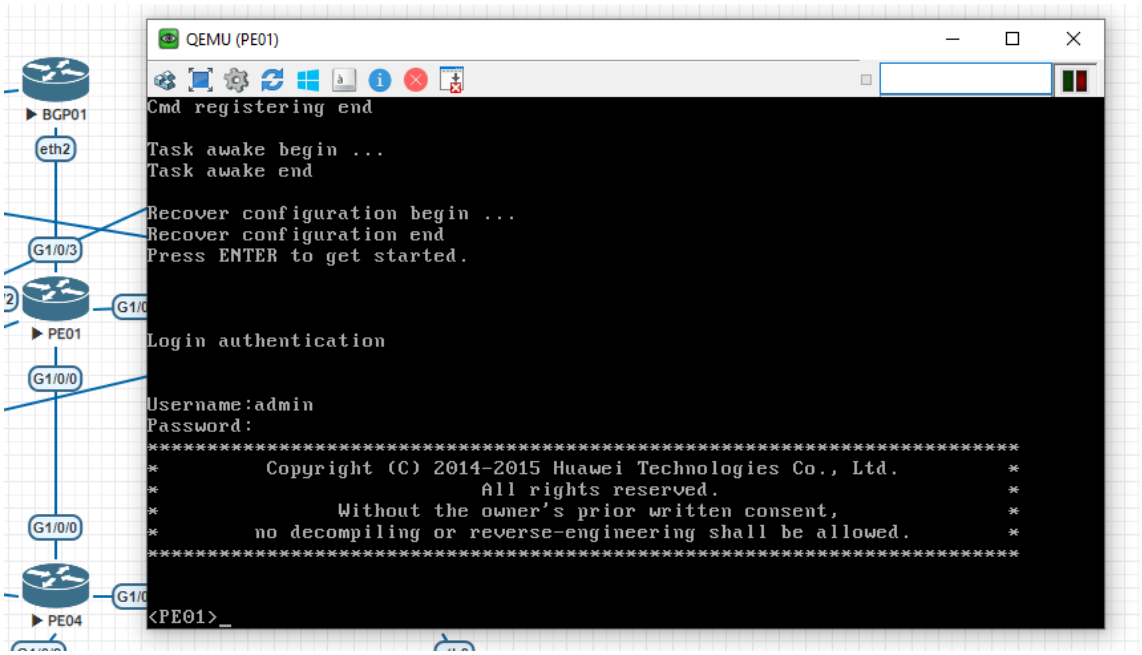
AUTOMATIZAÇÃO DE ANÚNCIOS DE TRÂNSITO BGP COM COMMUNITIES E VRF USANDO HUAWEI E MIKROTIK

Bem vindos ao nosso treinamento. Este é um guia que irá auxiliar no acompanhamento da aula.

Para iniciarmos precisamos alguns ajustes nos equipamentos USG6000v para que possamos utilizá-lo em nosso laboratório.

PREPARATIVOS



Abra os equipamentos Huawei pelo QEMU com um duplo clique. Usuário *admin* senha *Huawei@123*. Será necessário trocar a senha no primeiro acesso.

Ainda no QEMU, insira os comandos abaixo:

```
<HUAWEI> system-view
[HUAWEI] firewall dataplane to manageplane application-apperceive
default-action min-to-cp
[HUAWEI]aaa
[HUAWEI-aaa] manager-user admin
[HUAWEI-aaa-manager-user-admin] service-type terminal ssh

[HUAWEI]interface GigabitEthernet0/0/0
[HUAWEI-GigabitEthernet0/0/0]undo ip address
[HUAWEI-GigabitEthernet0/0/0]ip address dhcp-alloc
```

```
[HUAWEI]firewall zone trust
[HUAWEI-zone-trust] add interface GigabitEthernet0/0/0
[HUAWEI-zone-trust] add interface GigabitEthernet1/0/0
[HUAWEI-zone-trust] add interface GigabitEthernet1/0/1
[HUAWEI-zone-trust] add interface GigabitEthernet1/0/2
[HUAWEI-zone-trust] add interface GigabitEthernet1/0/3

[HUAWEI]stelnet server enable
[HUAWEI]ssh user admin
[HUAWEI]ssh user admin authentication-type password
[HUAWEI]ssh user admin service-type stelnet
```

Com isso nosso USG já está apto a ser acessado via SSH e a funcionar como um roteador normal, como precisamos.

Para saber qual IP a interface Gi0/0/0 pegou pelo DHCP utilize o comando abaixo:

```
[HUAWEI]display ip interface brief

Interface                         IP Address/Mask      Physical   Protocol
GigabitEthernet0/0/0                192.168.8.147/24     up         up
```

MPLS

Abaixo a configuração básica do MPLS dos equipamentos Huawei.

```
#
mpls lsr-id 10.99.99.1
mpls
#
mpls ldp
#
interface GigabitEthernet1/0/0
 undo shutdown
 mtu 1600
 ip address 10.0.0.5 255.255.255.252
 ospf network-type p2p
 ospf ldp-sync
 ospf enable 1 area 0.0.0.0
 mpls
 mpls ldp
 service-manage ping permit
#
interface GigabitEthernet1/0/1
 undo shutdown
 mtu 1600
```

```
 ip address 10.0.0.1 255.255.255.252
 ospf network-type p2p
 ospf ldp-sync
 ospf enable 1 area 0.0.0.0
 mpls
 mpls ldp
 service-manage ping permit
#
interface LoopBack0
 ip address 10.99.99.1 255.255.255.255
 ospf enable 1 area 0.0.0.0
#
ospf 1 router-id 10.99.99.1
 area 0.0.0.0
#
```

VRF

Abaixo a configuração para a criação do Serviço de VRF na rede.

```
#
ip vpn-instance teste
 ipv4-family
  route-distinguisher 10.99.99.1:100
  vpn-target 100:100 export-extcommunity
  vpn-target 100:100 import-extcommunity
#
bgp 65000
 peer 10.99.99.2 as-number 65000
 peer 10.99.99.2 connect-interface LoopBack0
 peer 10.99.99.3 as-number 65000
 peer 10.99.99.3 connect-interface LoopBack0
 peer 10.99.99.4 as-number 65000
 peer 10.99.99.4 connect-interface LoopBack0
 #
 ipv4-family unicast
  undo synchronization
  peer 10.99.99.2 enable
  peer 10.99.99.2 advertise-community
  peer 10.99.99.3 enable
  peer 10.99.99.3 reflect-client
  peer 10.99.99.3 advertise-community
  peer 10.99.99.4 enable
  peer 10.99.99.4 reflect-client
  peer 10.99.99.4 advertise-community
 #
 ipv4-family vpnv4
  policy vpn-target
  peer 10.99.99.2 enable
  peer 10.99.99.2 advertise-community
  peer 10.99.99.3 enable
  peer 10.99.99.3 reflect-client
  peer 10.99.99.3 advertise-community
  peer 10.99.99.4 enable
```

```
  peer 10.99.99.4 reflect-client
  peer 10.99.99.4 advertise-community
 #
 ipv4-family vpn-instance teste
  import-route direct
  import-route static
#
```

ATIVAÇÃO DE UM CLIENTE

Configuração no PE para a ativação de um cliente.

```
#
interface GigabitEthernet1/0/2
 undo shutdown
 ip binding vpn-instance teste
 ip address 192.0.2.1 255.255.255.252
 service-manage ping permit
#
ip ip-prefix CLI_65100 index 10 permit 198.18.0.0 21 greater-equal 21
less-equal 24
#
route-policy POL_CLI_65100_IN permit node 10
 if-match ip-prefix CLI_65100
 apply community 65000:100 65000:200 65000:300
#
bgp 65000
#
 ipv4-family vpn-instance teste
  import-route direct
  import-route static
  peer 192.0.2.2 as-number 65100
  peer 192.0.2.2 route-policy POL_CLI_65100_IN import
#
```

CONFIGURAÇÃO DO FILTRO NO BGP

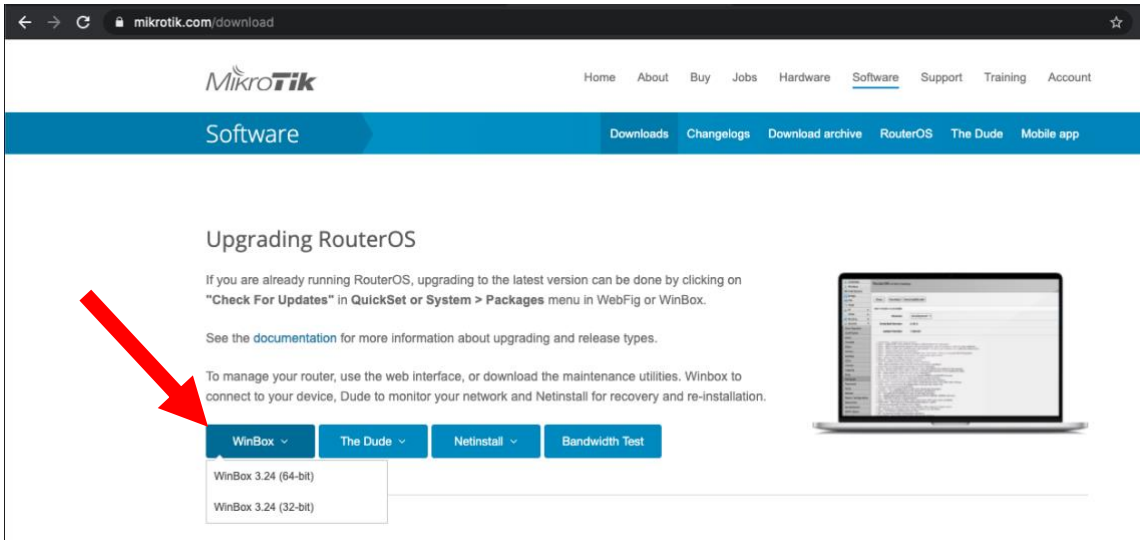
Configuração no PE para a ativação de um cliente.

```
#
ip community-filter basic OPER02 permit 65000:200
#
route-policy OPER02_OUT-v4 permit node 10
 if-match community-filter OPER02
#
bgp 65000
```

```
 peer 172.16.0.9 as-number 65000
#
 ipv4-family unicast
  undo synchronization
  peer 172.16.0.9 enable
  peer 172.16.0.9 route-policy OPER02_OUT-v4 import
#
```

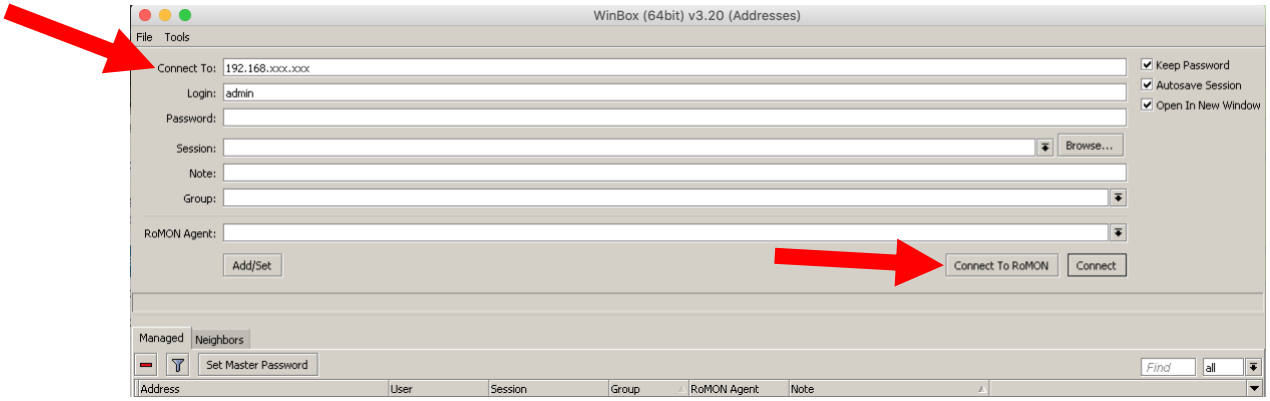
PREPARATIVOS PARA ACESSAR O ROTEADOR MIKROTIK:

Para iniciarmos o acesso ao Roteador Mikrotik precisamos baixar o aplicativo de acesso gráfico chamado Winbox para que possamos utilizá-lo em nosso laboratório.



Abram os equipamentos MIKROTIK pelo Winbox com um duplo clique. Coloque o ip dos equipamentos, usuário *admin e sem senha*.

Outra dica é: No emulador o acesso é feito por IP no primeiro roteador e nos demais usando o recurso “Connect to Romon”.



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Apartir do acesso ao winbox seguem os comandos para ser usados no menu “New Terminal” ou sigam os menus:

PE03:

```
/interface bridge
add name=Loop0 protocol-mode=none
add name=Loop1 protocol-mode=none
/interface ethernet
set [ find default-name=ether2 ] mtu=1600
set [ find default-name=ether4 ] mtu=1600
/ip ipsec proposal
set [ find default=yes ] disabled=yes
/routing bgp instance
set default as=65000 router-id=10.99.99.3
add as=65000 client-to-client-reflection=no name=VRF router-
id=10.88.88.3 routing-table=teste
/ip firewall connection tracking
set tcp-established-timeout=3h
/ip address
add address=10.99.99.3 interface=Loop0 network=10.99.99.3
add address=10.0.0.13/30 interface=ether2 network=10.0.0.12
add address=10.0.0.10/30 interface=ether4 network=10.0.0.8
add address=192.0.2.5/30 interface=ether3 network=192.0.2.4
add address=10.88.88.3 interface=Loop0 network=10.88.88.3
/ip dhcp-client
add add-default-route=no disabled=no interface=ether1
/ip ipsec policy
set 0 disabled=yes
/ip route vrf
add export-route-targets=100:100 import-route-targets=100:100
interfaces=ether3 route-distinguisher=100:100 routing-mark=teste
/ip service
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
/ip ssh
set strong-crypto=yes
/mpls interface
set [ find default=yes ] mpls-mtu=1600
/mpls ldp
set enabled=yes lsr-id=10.99.99.3
/mpls ldp interface
add interface=ether2
add interface=ether4
add interface=Loop0
/routing bgp instance vrf
add redistribute-connected=yes redistribute-other-bgp=yes
redistribute-static=yes routing-mark=100:100
/routing bgp peer
add address-families=ip,vpnv4 name=PE01 remote-address=10.99.99.1
remote-as=65000 ttl=default update-source=Loop0
add address-families=ip,vpnv4 name=PE02 remote-address=10.99.99.2
remote-as=65000 ttl=default update-source=Loop0
```

```
add default-originate=always in-filter=AS-65200-IN instance=VRF
name=65200 nexthop-choice=force-self out-filter=AS-65200-OUT remote-
address=192.0.2.6 remote-as=65200 ttl=default update-source=ether3
/routing filter
add action=accept append-bgp-communities=65000:100,65000:200,65000:300
chain=AS-65200-IN prefix=198.19.0.0/21 prefix-length=21-24
add action=discard chain=AS-65200-IN
add action=accept chain=AS-65200-OUT
/routing ospf interface
add interface=Loop0 network-type=broadcast
add interface=ether2 network-type=point-to-point
add interface=ether4 network-type=point-to-point
/routing ospf network
add area=backbone network=10.0.0.12/30
add area=backbone network=10.0.0.8/30
add area=backbone network=10.99.99.3/32
/system identity
set name=PE03
/tool bandwidth-server
set authenticate=no enabled=no
/tool romon
set enabled=yes secrets=12345
```

PE02:

```
/interface bridge
add name=Loop0 protocol-mode=none
/interface ethernet
set [ find default-name=ether2 ] mtu=1600
set [ find default-name=ether3 ] mtu=1600
/ip ipsec proposal
set [ find default=yes ] disabled=yes
/routing bgp instance
set default as=65000 router-id=10.0.0.2
/ip firewall connection tracking
set tcp-established-timeout=3h
/ip address
add address=10.0.0.2/30 interface=ether3 network=10.0.0.0
add address=10.0.0.9/30 interface=ether2 network=10.0.0.8
add address=10.99.99.2 interface=Loop0 network=10.99.99.2
/ip dhcp-client
add add-default-route=no disabled=no interface=ether1
/ip ipsec policy
set 0 disabled=yes
/ip service
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
/mpls ldp
set enabled=yes lsr-id=10.99.99.2
/mpls ldp interface
add interface=ether2
add interface=ether3
add interface=Loop0
/routing bgp instance vrf
```

```
add    redistribute-connected=yes    redistribute-static=yes    routing-
mark=100:100
/routing bgp peer
add   address-families=ip,vpnv4   name=PE01   remote-address=10.99.99.1
remote-as=65000 ttl=default update-source=Loop0
add   address-families=ip,vpnv4   name=PE03   remote-address=10.99.99.3
remote-as=65000 route-reflect=yes ttl=default update-source=Loop0
add   address-families=ip,vpnv4   name=PE04   remote-address=10.99.99.4
remote-as=65000 route-reflect=yes ttl=default update-source=Loop0
/routing ospf interface
add interface=Loop0 network-type=broadcast
add interface=ether2 network-type=point-to-point
add interface=ether3 network-type=point-to-point
/routing ospf network
add area=backbone network=10.99.99.2/32
add area=backbone network=10.0.0.0/30
add area=backbone network=10.0.0.8/30
/system identity
set name=PE02
/tool bandwidth-server
set authenticate=no enabled=no
/tool romon
set enabled=yes secrets=12345
```

CLI1

```
/ip ipsec proposal
set [ find default=yes ] disabled=yes
/routing bgp instance
set default as=65100
/ip firewall connection tracking
set tcp-established-timeout=3h
/ip address
add address=192.0.2.2/30 interface=ether2 network=192.0.2.0
/ip dhcp-client
add add-default-route=no disabled=no interface=ether1
/ip ipsec policy
set 0 disabled=yes
/ip service
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
/routing bgp network
add network=198.18.0.0/21 synchronize=no
add network=198.18.0.0/22 synchronize=no
add network=198.18.0.0/23 synchronize=no
add network=198.18.0.0/24 synchronize=no
add network=198.18.1.0/24 synchronize=no
add network=198.18.2.0/23 synchronize=no
add network=198.18.2.0/24 synchronize=no
add network=198.18.3.0/24 synchronize=no
add network=198.18.4.0/22 synchronize=no
add network=198.18.4.0/23 synchronize=no
add network=198.18.7.0/24 synchronize=no
add network=198.18.5.0/24 synchronize=no
add network=198.18.6.0/23 synchronize=no
add network=198.18.6.0/24 synchronize=no
```

```
add network=198.18.4.0/24 synchronize=no
/routing bgp peer
add     name=OPER_65000     remote-address=192.0.2.1     remote-as=65000
ttl=default
/system identity
set name=CLI-1
/tool bandwidth-server
set authenticate=no enabled=no
/tool romon
set enabled=yes secrets=12345
```

CLI2:

```
/ip ipsec proposal
set [ find default=yes ] disabled=yes
/routing bgp instance
set default as=65200 router-id=198.19.0.1
/ip firewall connection tracking
set tcp-established-timeout=3h
/ip address
add address=192.0.2.6/30 interface=ether2 network=192.0.2.4
add address=198.19.0.1 interface=ether1 network=198.19.0.1
/ip dhcp-client
add add-default-route=no disabled=no interface=ether1
/ip ipsec policy
set 0 disabled=yes
/ip route
add distance=21 gateway=192.0.2.5
/ip service
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
/routing bgp network
add network=198.19.0.0/21 synchronize=no
add network=198.19.0.0/24 synchronize=no
add network=198.19.0.0/22 synchronize=no
add network=198.19.1.0/24 synchronize=no
add network=198.19.2.0/24 synchronize=no
add network=198.19.0.0/23 synchronize=no
add network=198.19.3.0/24 synchronize=no
add network=198.19.4.0/24 synchronize=no
add network=198.19.5.0/24 synchronize=no
add network=198.19.6.0/24 synchronize=no
add network=198.19.7.0/24 synchronize=no
add network=198.19.2.0/23 synchronize=no
add network=198.19.4.0/23 synchronize=no
add network=198.19.6.0/23 synchronize=no
/routing bgp peer
add name=AS-65000 remote-address=192.0.2.5 remote-as=65000 ttl=default
update-source=ether2
/system identity
set name=CLI2
/tool bandwidth-server
set authenticate=no enabled=no
/tool romon
set enabled=yes secrets=12345
```

CDN:

```
/interface bridge
add name=FNA protocol-mode=none
add name=GGC protocol-mode=none
add name=OCA protocol-mode=none
/ip ipsec proposal
set [ find default=yes ] disabled=yes
/routing bgp instance
set default as=65000 redistribute-connected=yes redistribute-static=yes
/ip firewall connection tracking
set tcp-established-timeout=3h
/ip address
add address=172.16.0.2/30 interface=ether2 network=172.16.0.0
add address=192.0.2.193/30 interface=FNA network=192.0.2.192
add address=192.0.2.197/30 interface=GGC network=192.0.2.196
add address=192.0.2.201/30 interface=OCA network=192.0.2.200
/ip dhcp-client
add add-default-route=no disabled=no interface=ether1
/ip ipsec policy
set 0 disabled=yes
/ip service
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
/routing bgp peer
add name=PE01 remote-address=172.16.0.1 remote-as=65000 ttl=default
add     in-filter=CDN_IN     name=FNA     out-filter=CDN_OUT     remote-
address=192.0.2.194 remote-as=63293 ttl=default
add     in-filter=CDN_IN     name=OCA     out-filter=CDN_OUT     remote-
address=192.0.2.202 remote-as=40027 ttl=default
add     in-filter=CDN_IN     name=GGC     out-filter=CDN_OUT     remote-
address=192.0.2.198 remote-as=11344 ttl=default
/routing filter
add action=accept bgp-communities=65000:300 chain=CDN_OUT
add action=discard bgp-communities="" chain=CDN_OUT
add action=discard chain=CDN_IN
/system identity
set name=CDN
/tool bandwidth-server
set authenticate=no enabled=no
/tool romon
set enabled=yes secrets=12345
```

BGP01:

```
/ip ipsec proposal
set [ find default=yes ] disabled=yes
/routing bgp instance
set default as=65000
/ip firewall connection tracking
set tcp-established-timeout=3h
/ip address
add address=172.16.0.6/30 interface=ether2 network=172.16.0.4
/ip dhcp-client
add add-default-route=no disabled=no interface=ether1
/ip ipsec policy
```

```
set 0 disabled=yes
/ip service
set www disabled=yes
set api disabled=yes
set api-ssl disabled=yes
/routing bgp peer
add  default-originate=always  in-filter=IN  name=PE01  out-filter=OUT
remote-address=172.16.0.5 remote-as=65000 ttl=default
/routing filter
add action=accept bgp-communities=65000:100 chain=OUT
add action=discard bgp-communities="" chain=OUT
add action=discard chain=IN

/system identity
set name=OPER01
/tool bandwidth-server
set authenticate=no enabled=no
/tool romon
set enabled=yes secrets=12345
```