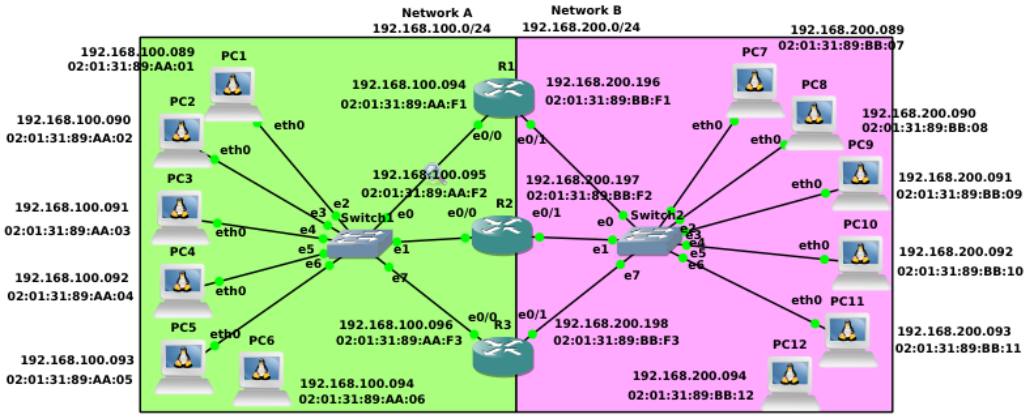
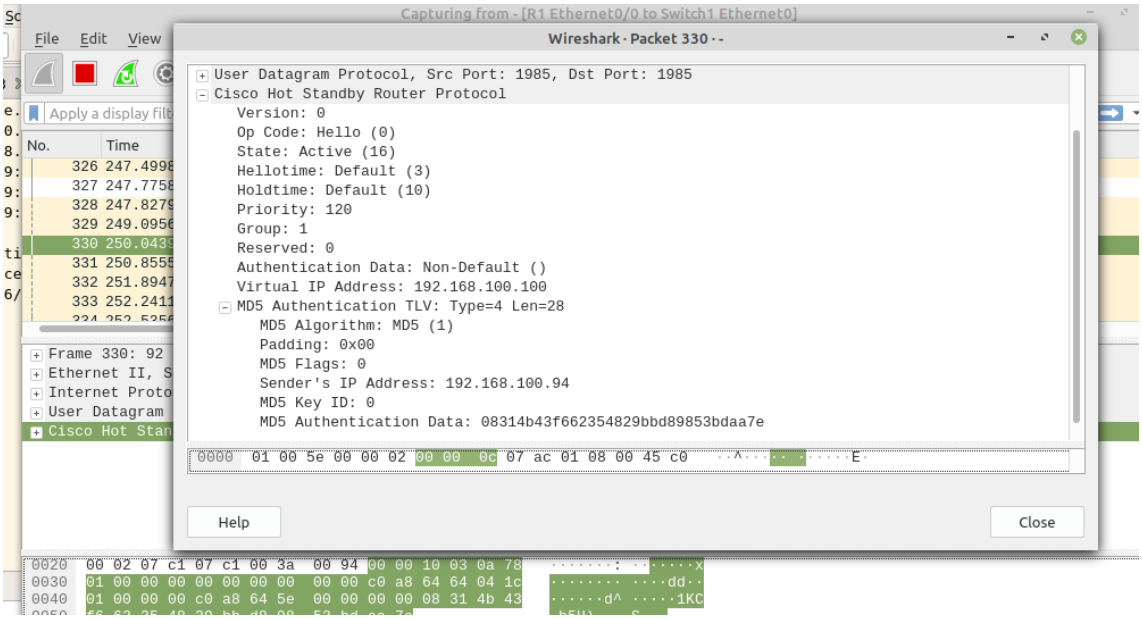


2-

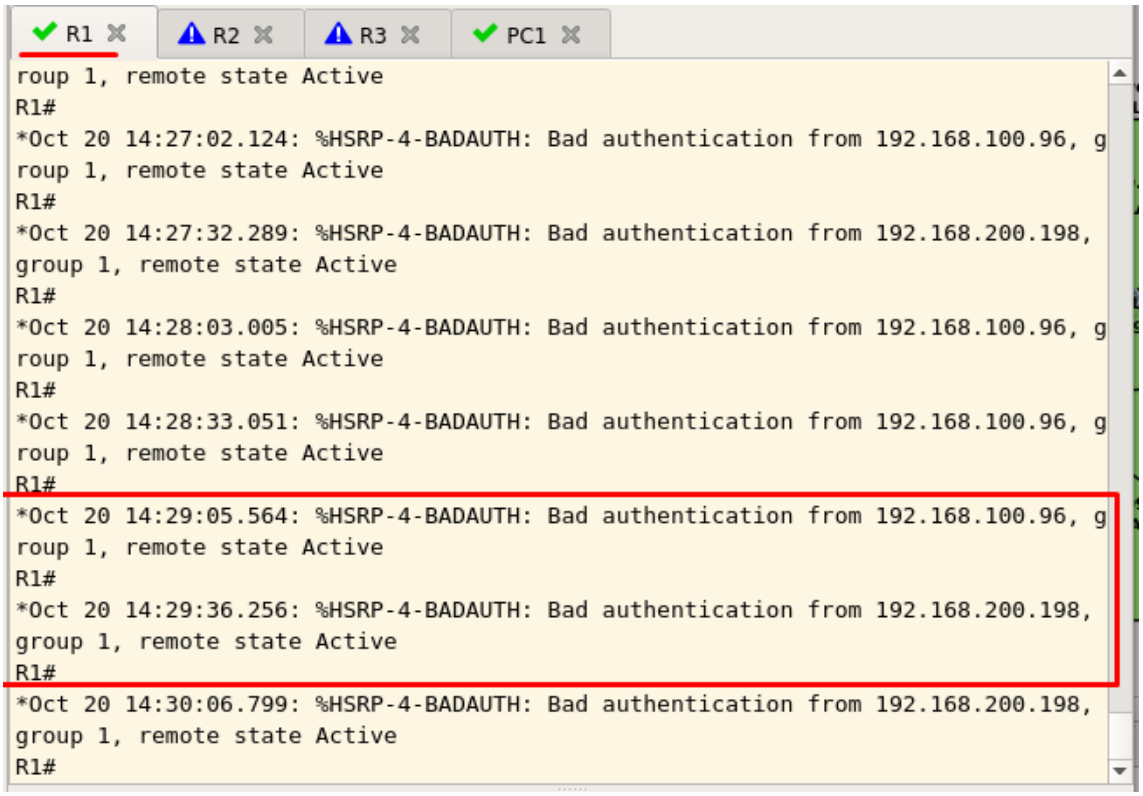
HSRP

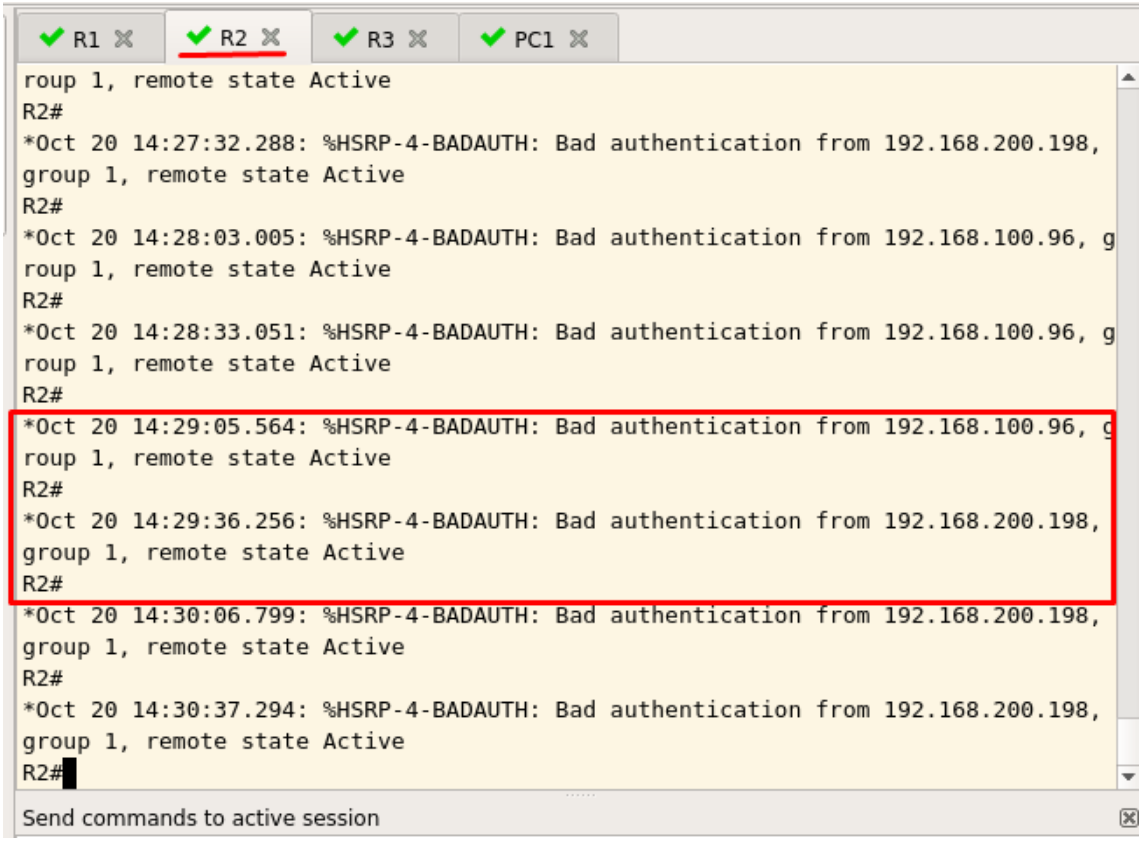
a)

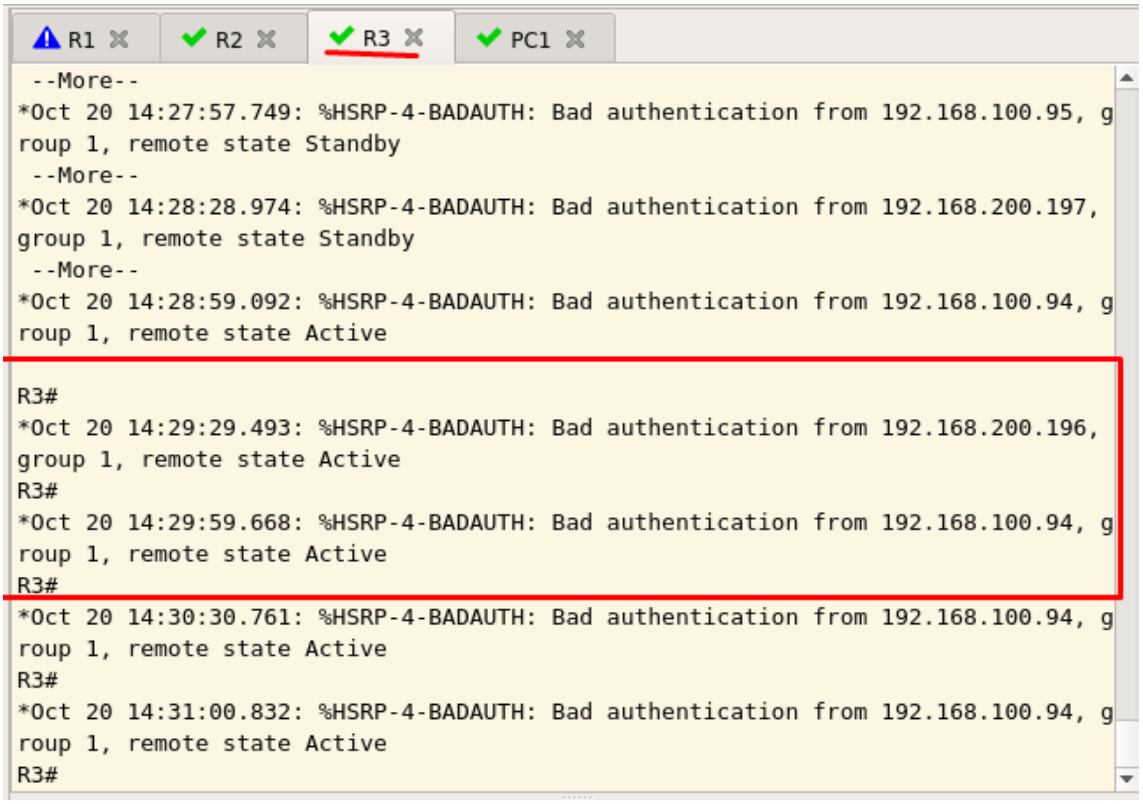
Existe conectividade nos terminais para ambas as redes!!



Mas:

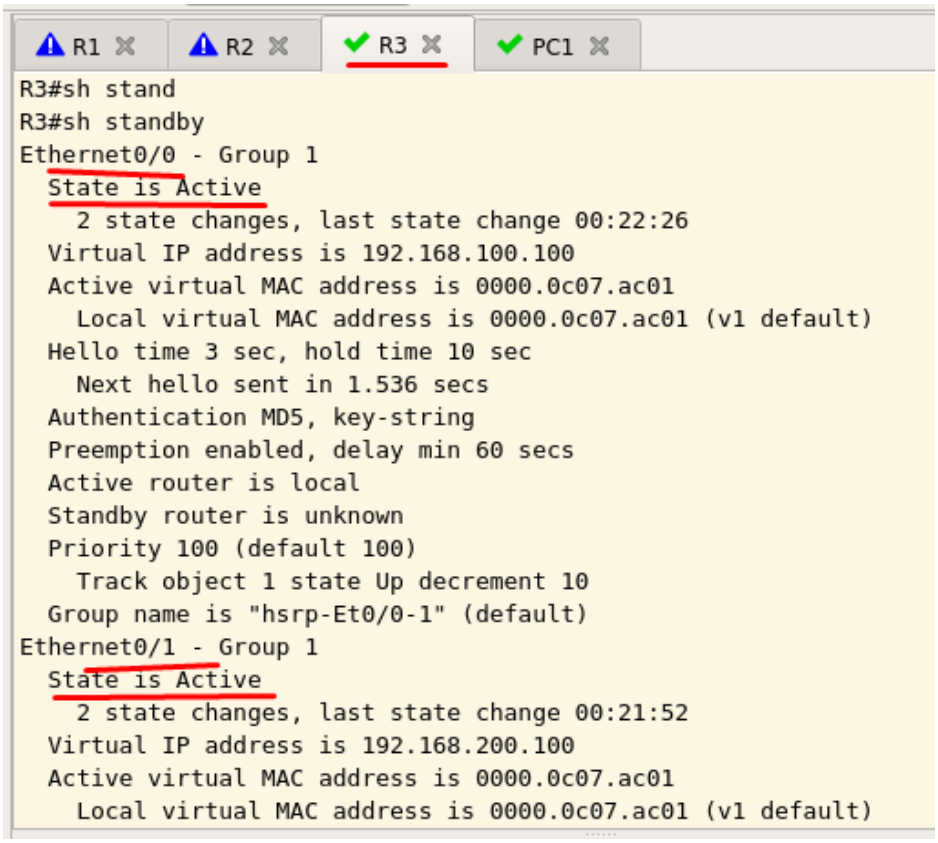

R1
R2
R3
PC1
roup 1, remote state Active
R1#
*Oct 20 14:27:02.124: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R1#
*Oct 20 14:27:32.289: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R1#
*Oct 20 14:28:03.005: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R1#
*Oct 20 14:28:33.051: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R1#
*Oct 20 14:29:05.564: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R1#
*Oct 20 14:29:36.256: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R1#
*Oct 20 14:30:06.799: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R1#


R1
R2
R3
PC1
roup 1, remote state Active
R2#
*Oct 20 14:27:32.288: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R2#
*Oct 20 14:28:03.005: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R2#
*Oct 20 14:28:33.051: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R2#
*Oct 20 14:29:05.564: %HSRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, remote state Active
R2#
*Oct 20 14:29:36.256: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R2#
*Oct 20 14:30:06.799: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R2#
*Oct 20 14:30:37.294: %HSRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, remote state Active
R2#
Send commands to active session

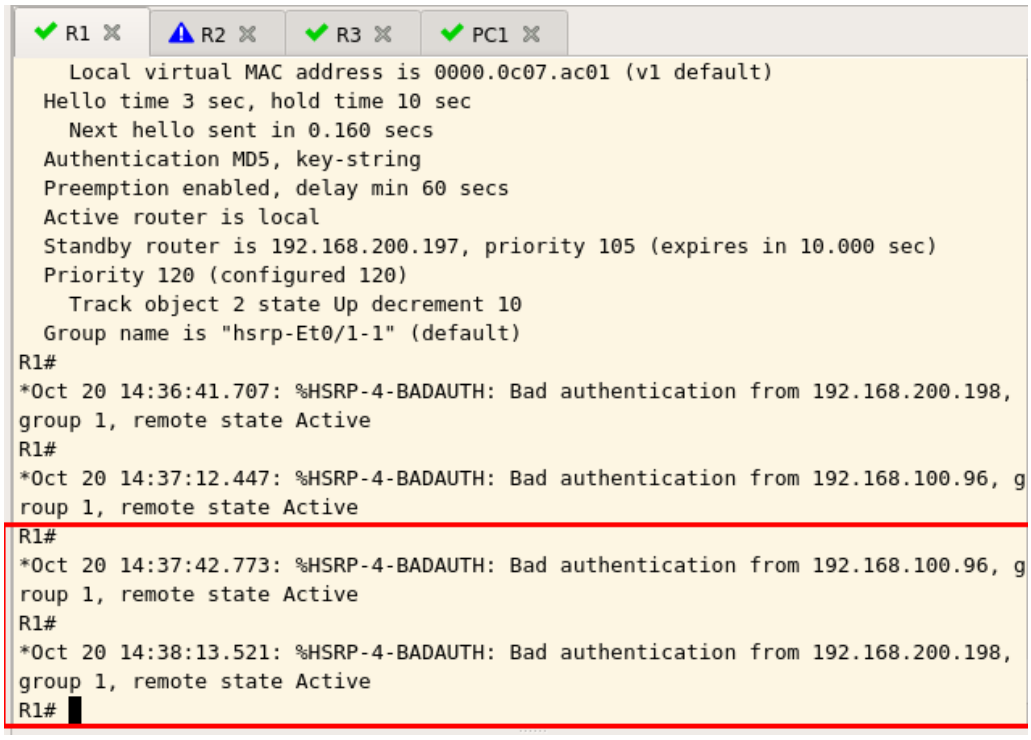


b)

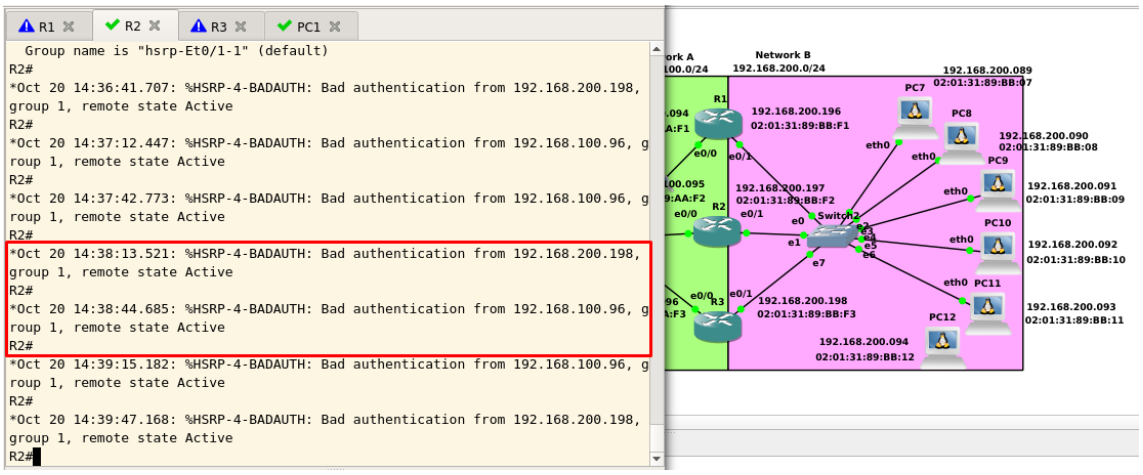
Depois de colocar R3 no mesmo grupo, mas senha distinta R3 passa também a Active!



Em R1 continua a avisar:



E em R2 também:



VRRP

Autenticação em R1 e R2 (master R1):

R1 R2 R3

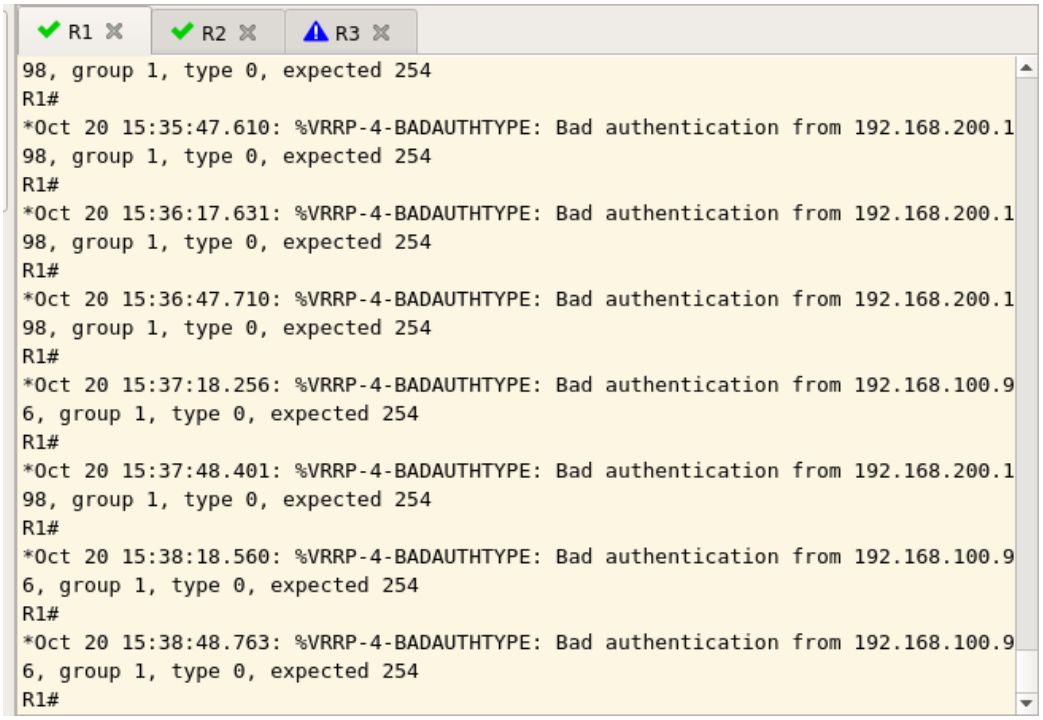
```
Ethernet0/0 - Group 1
  State is Master
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 110
    Track object 2 state Up decrement 10
  Authentication MD5, key-string
  Master Router is 192.168.100.94 (local), priority is 110
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.570 sec

Ethernet0/1 - Group 1
  State is Master
  Virtual IP address is 192.168.200.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 110
    Track object 1 state Up decrement 10
  Authentication MD5, key-string
  Master Router is 192.168.200.196 (local), priority is 110
```

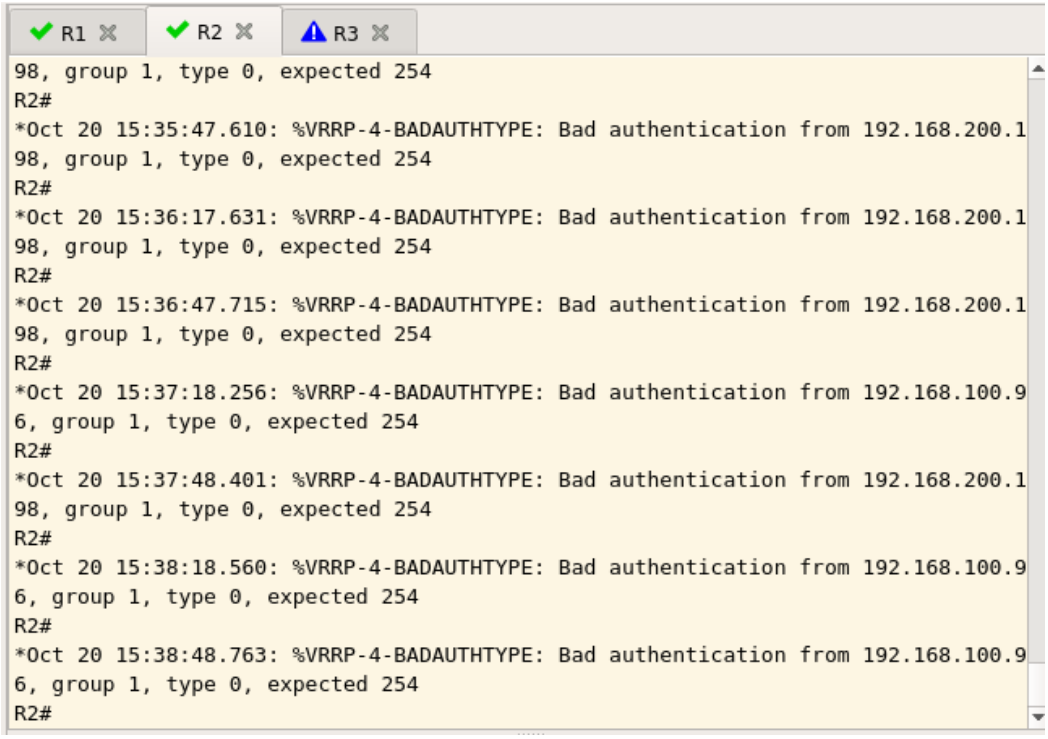
R1 R2 R3

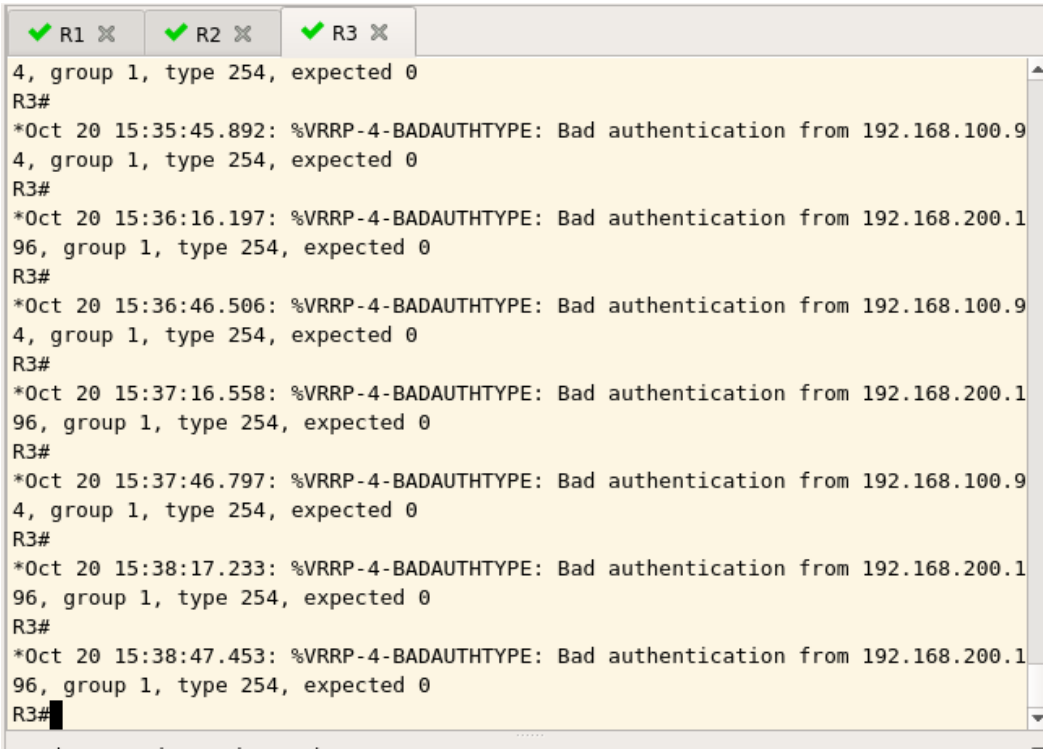
```
Ethernet0/0 - Group 1
  State is Backup
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 105
    Track object 2 state Up decrement 10
  Authentication MD5, key-string
  Master Router is 192.168.100.94, priority is 110
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.589 sec (expires in 3.577 sec)

Ethernet0/1 - Group 1
  State is Backup
  Virtual IP address is 192.168.200.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 105
    Track object 1 state Up decrement 10
  Authentication MD5, key-string
  Master Router is 192.168.200.196, priority is 110
```

a)

R3 integra o mesmo grupo, mas sem qualquer autenticação

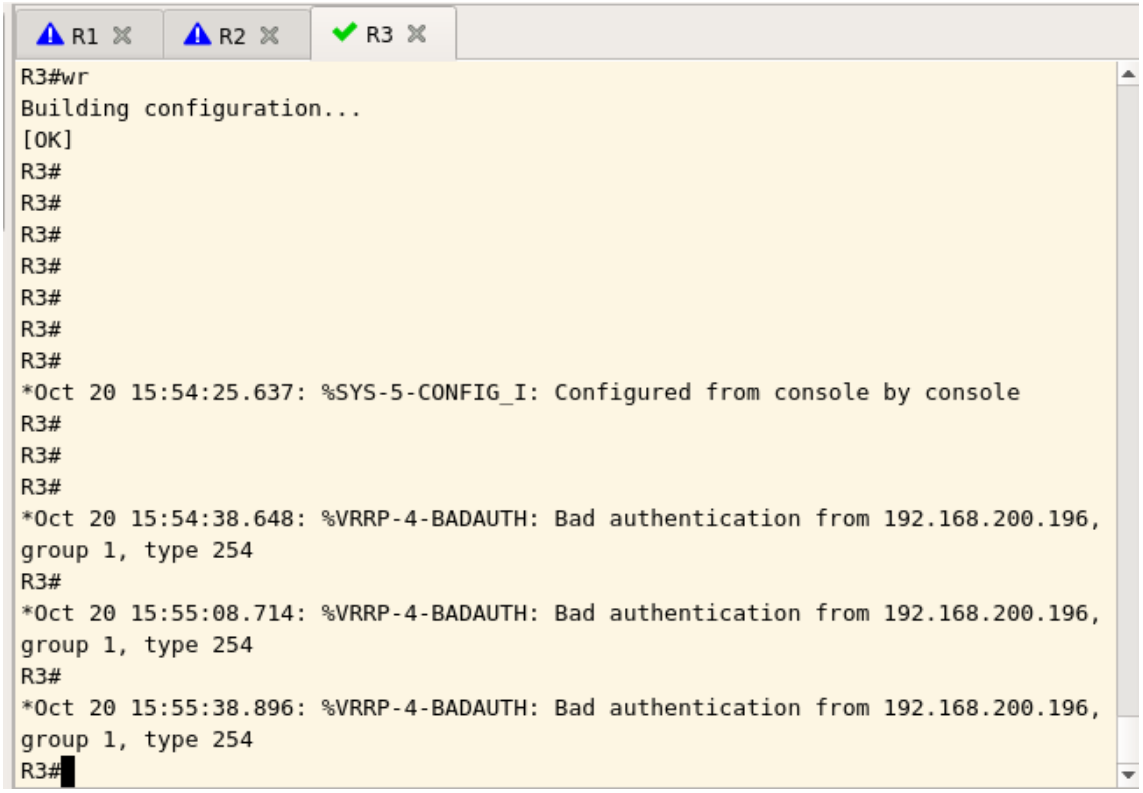


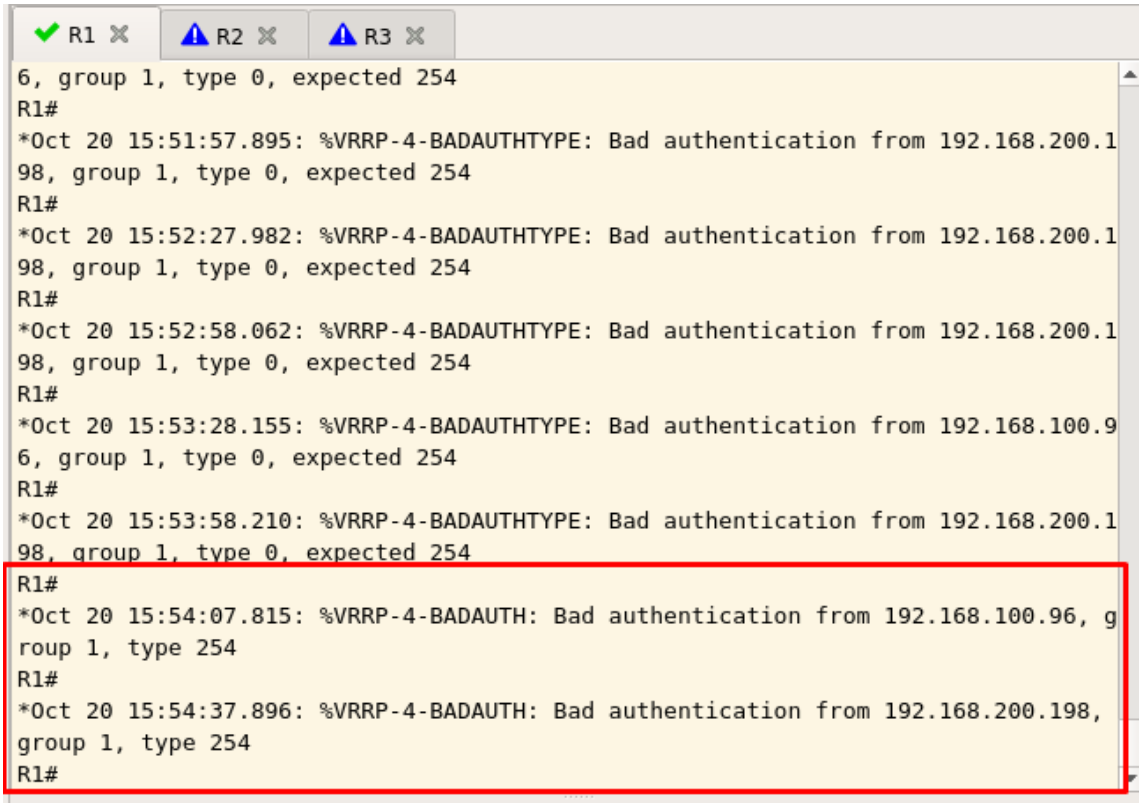


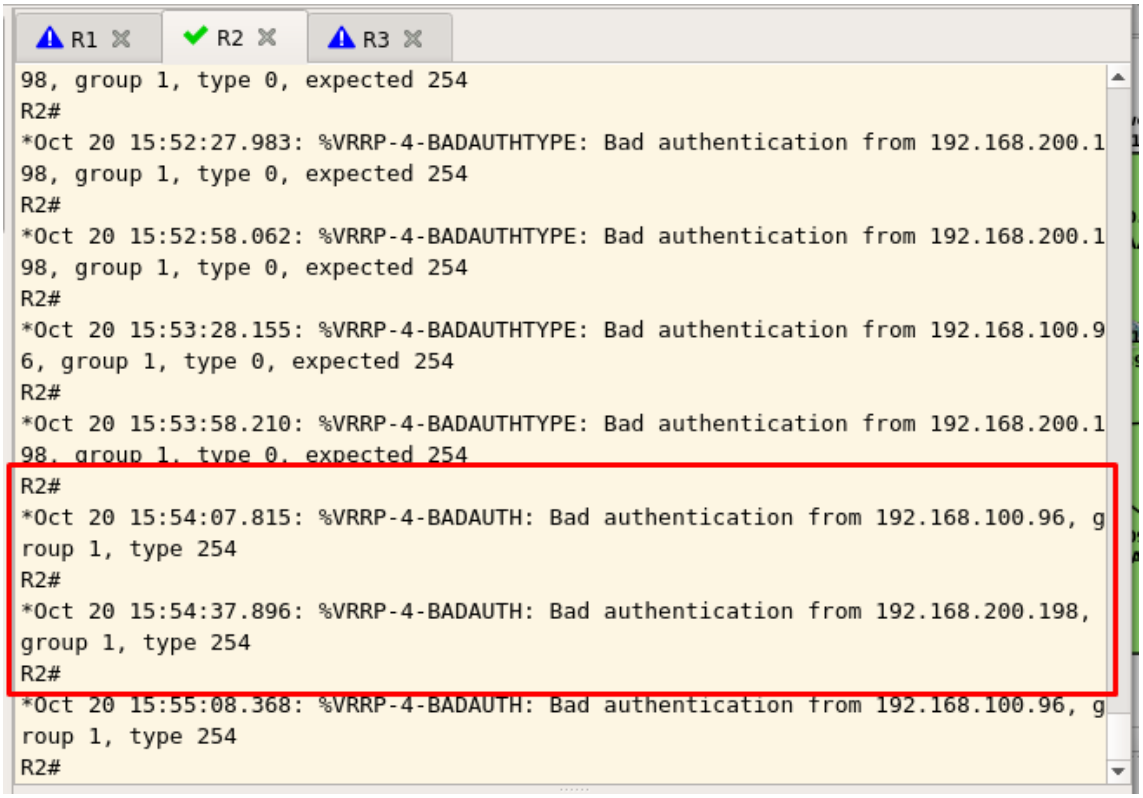


b)

R3 integra o mesmo grupo, mas com uma senha distinta

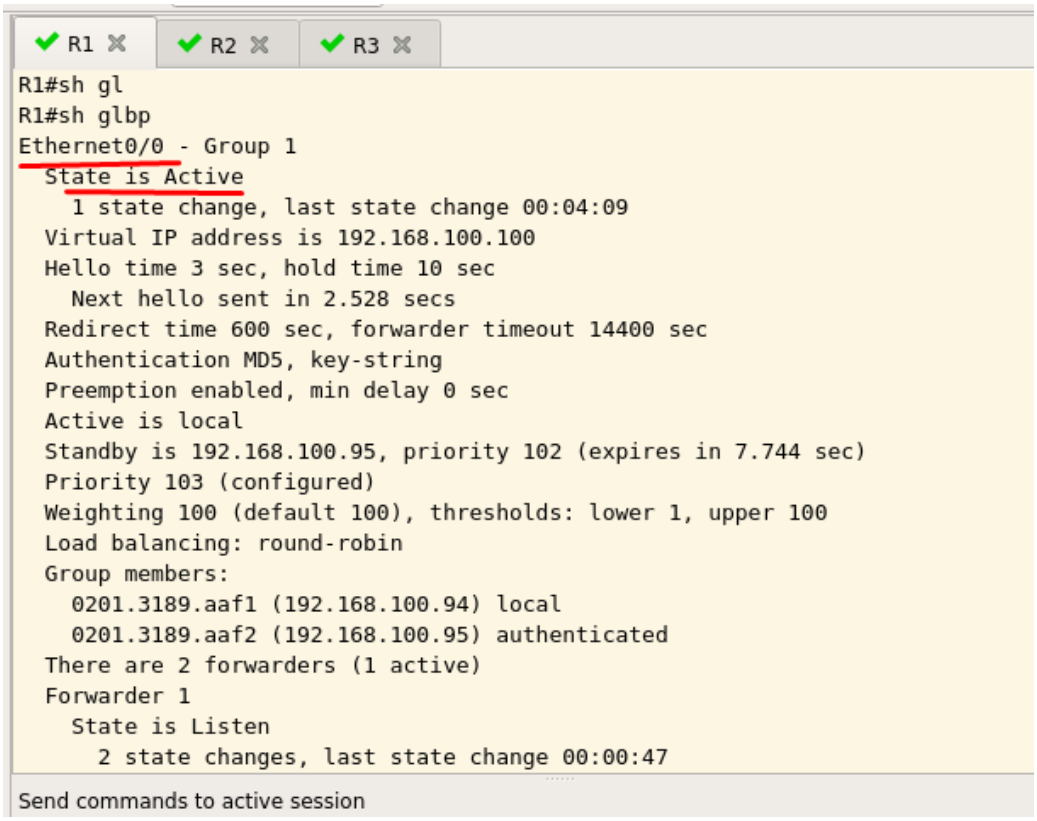


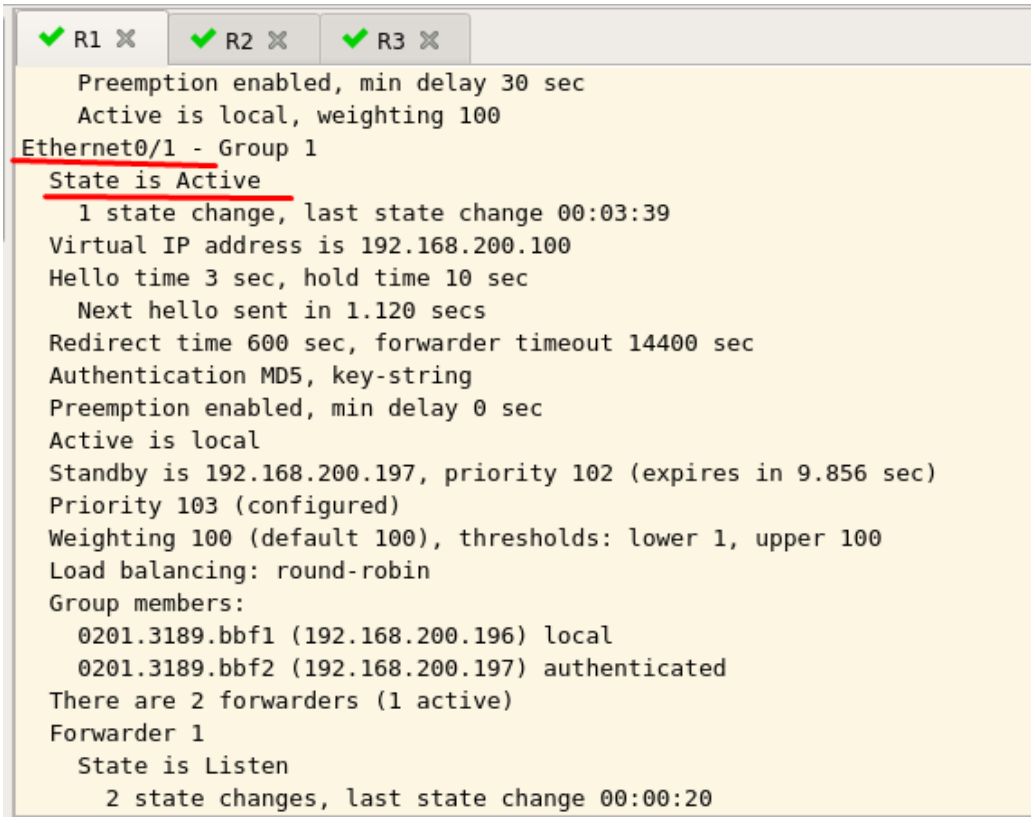

R1
R2
R3
6, group 1, type 0, expected 254
R1#
*Oct 20 15:51:57.895: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R1#
*Oct 20 15:52:27.982: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R1#
*Oct 20 15:52:58.062: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R1#
*Oct 20 15:53:28.155: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.100.9
6, group 1, type 0, expected 254
R1#
*Oct 20 15:53:58.210: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R1#
*Oct 20 15:54:07.815: %VRRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, type 254
R1#
*Oct 20 15:54:37.896: %VRRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, type 254
R1#


R1
R2
R3
98, group 1, type 0, expected 254
R2#
*Oct 20 15:52:27.983: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R2#
*Oct 20 15:52:58.062: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R2#
*Oct 20 15:53:28.155: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.100.9
6, group 1, type 0, expected 254
R2#
*Oct 20 15:53:58.210: %VRRP-4-BADAUTHTYPE: Bad authentication from 192.168.200.1
98, group 1, type 0, expected 254
R2#
*Oct 20 15:54:07.815: %VRRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, type 254
R2#
*Oct 20 15:54:37.896: %VRRP-4-BADAUTH: Bad authentication from 192.168.200.198,
group 1, type 254
R2#
*Oct 20 15:55:08.368: %VRRP-4-BADAUTH: Bad authentication from 192.168.100.96, g
roup 1, type 254
R2#

GLBP

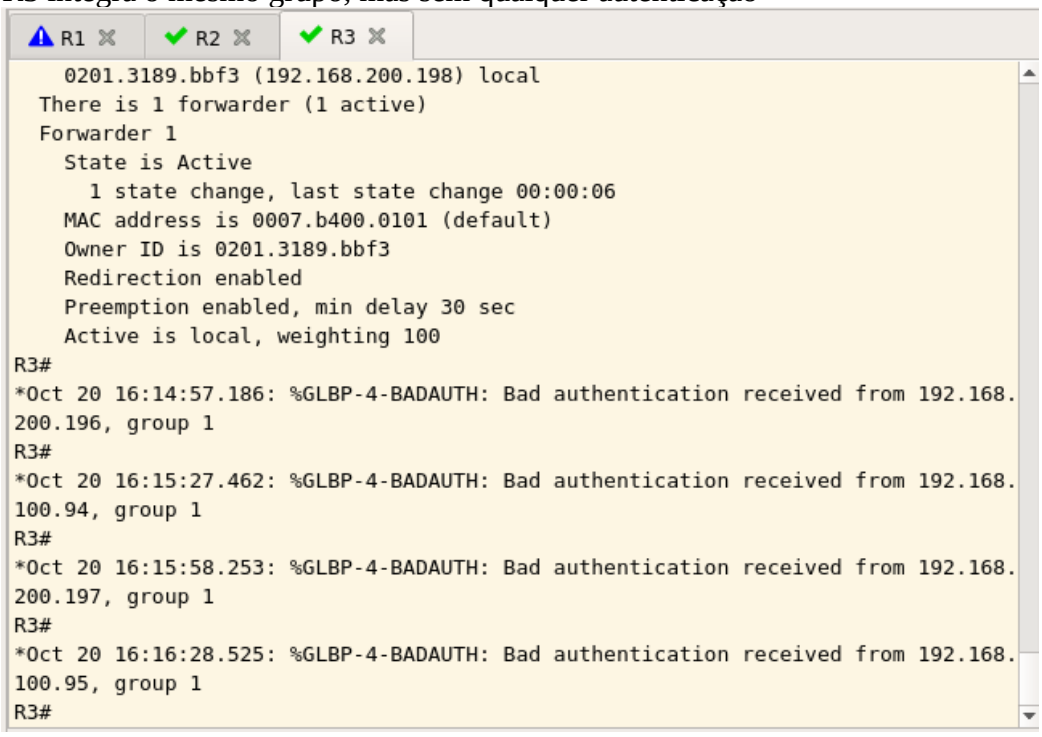
Autenticação em R1 e R2 (R1 Active):

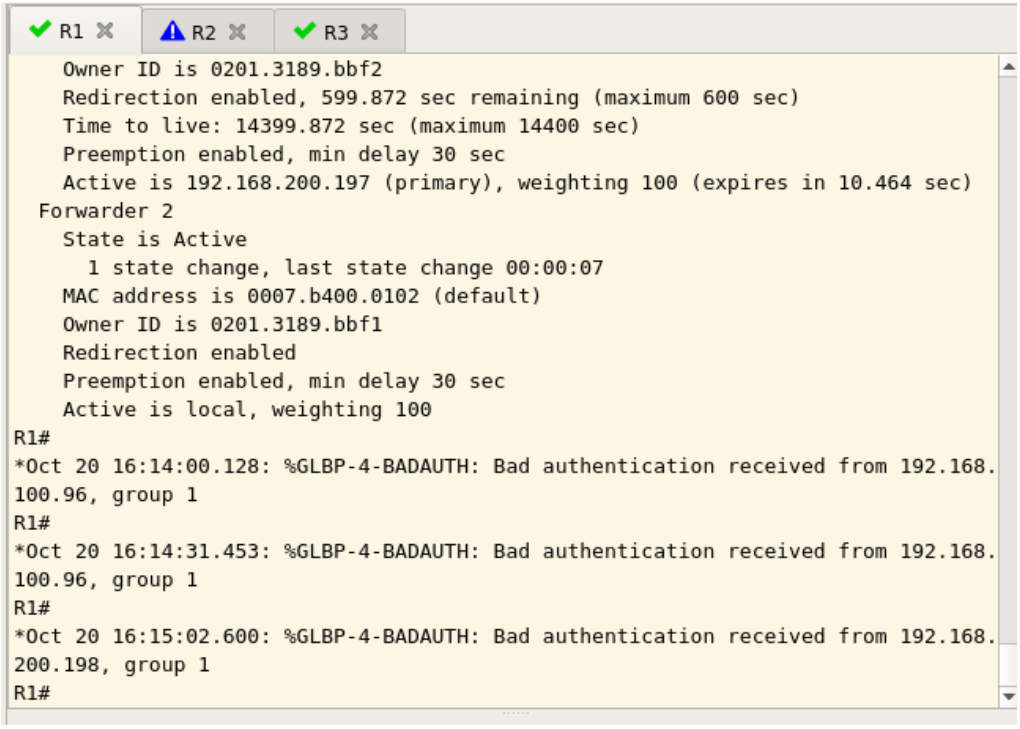


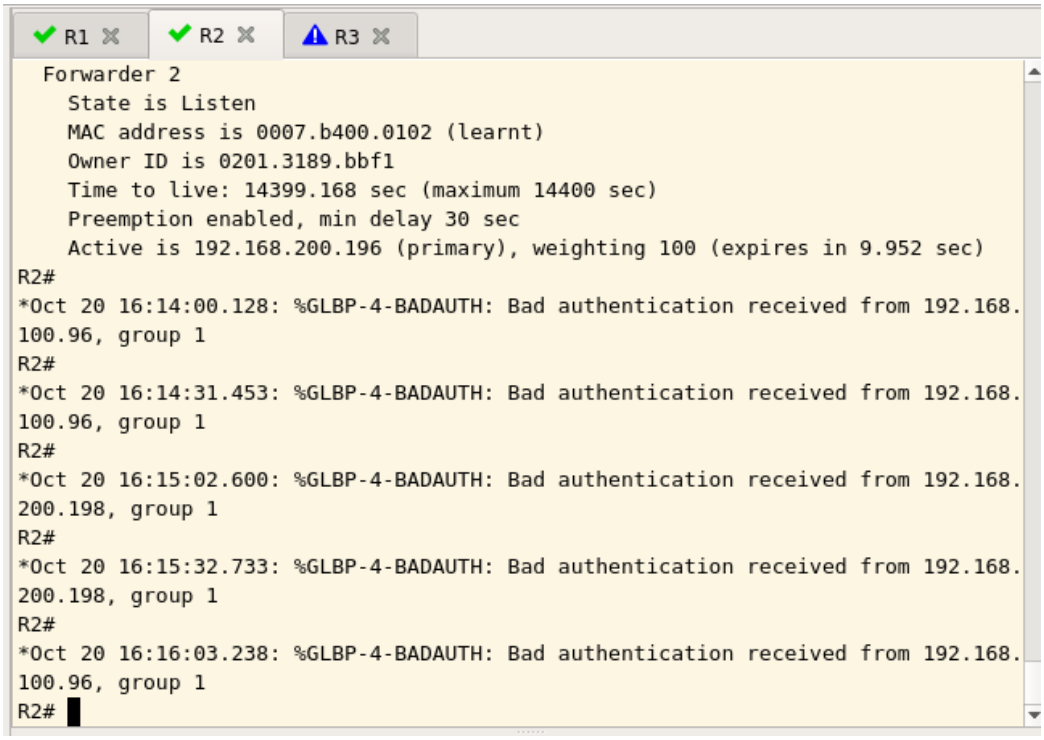


a)

R3 integra o mesmo grupo, mas sem qualquer autenticação

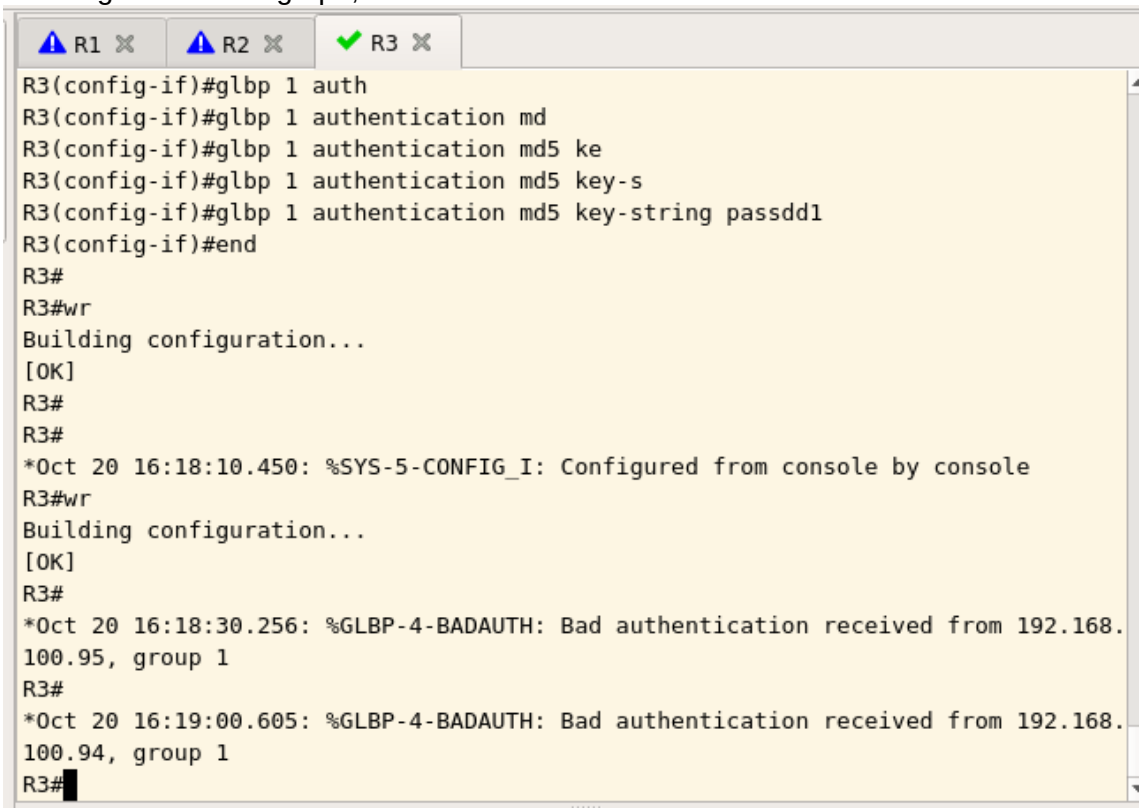


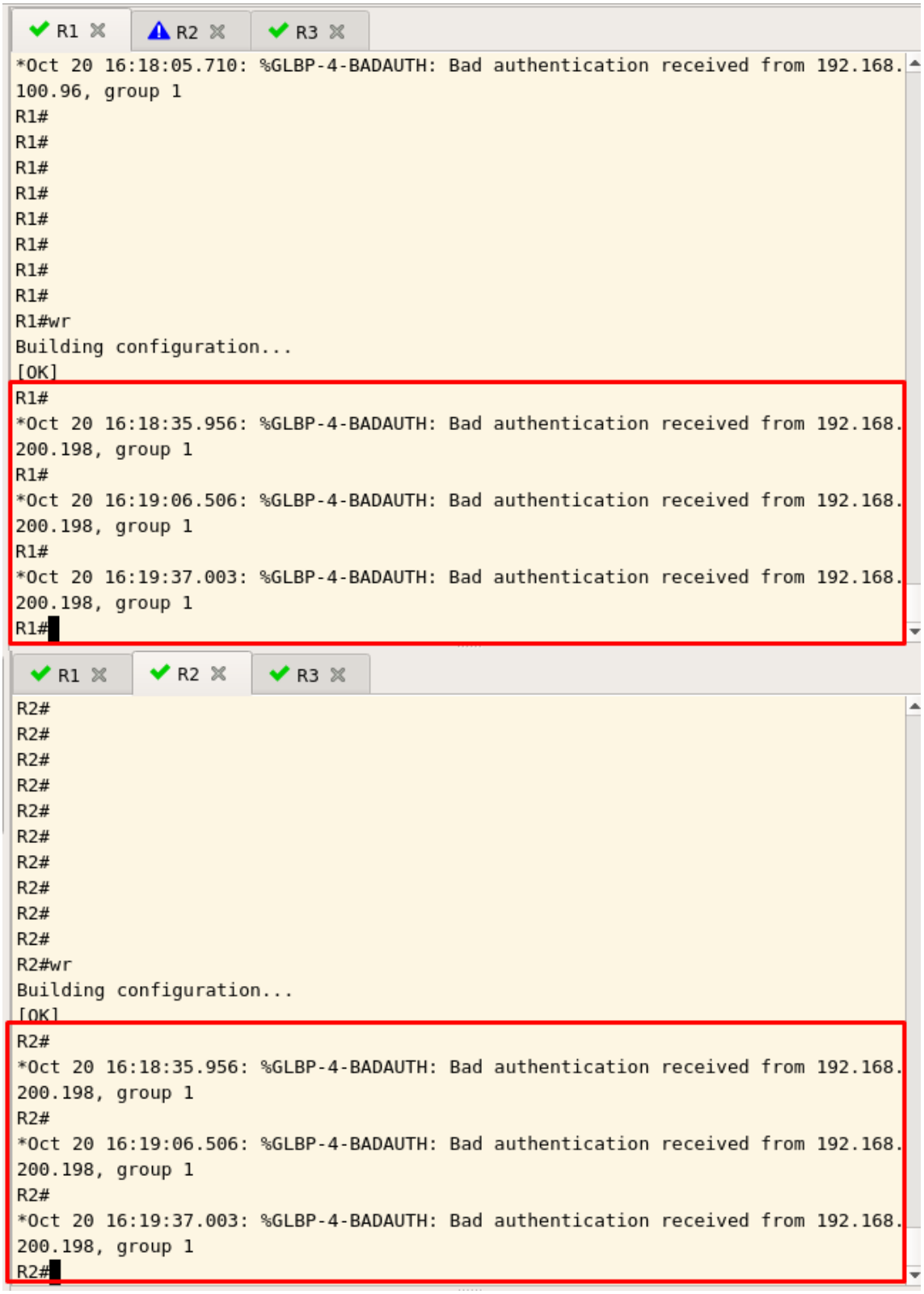




b)

R3 integra o mesmo grupo, mas com uma senha distinta




R1
R2
R3
*Oct 20 16:18:05.710: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
100.96, group 1
R1#
R1#
R1#
R1#
R1#
R1#
R1#
R1#
R1#wr
Building configuration...
[OK]
R1#
*Oct 20 16:18:35.956: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
200.198, group 1
R1#
*Oct 20 16:19:06.506: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
200.198, group 1
R1#
*Oct 20 16:19:37.003: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
200.198, group 1
R1#
R1
R2
R3
R2#
R2#
R2#
R2#
R2#
R2#
R2#
R2#
R2#
R2#wr
Building configuration...
[OK]
R2#
*Oct 20 16:18:35.956: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
200.198, group 1
R2#
*Oct 20 16:19:06.506: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
200.198, group 1
R2#
*Oct 20 16:19:37.003: %GLBP-4-BADAUTH: Bad authentication received from 192.168.
200.198, group 1
R2#

3-

Depois de aplicar o VRRP no R3 com o ip virtual da network A:

```
R3(config-if)#vrrp 1 ip 192.168.100.100
R3(config-if)#
*Oct 19 18:55:47.353: %VRRP-6-STATECHANGE: Et0/0 Grp 1 state Init -> Backup
*Oct 19 18:55:47.358: %VRRP-6-STATECHANGE: Et0/0 Grp 1 state Init -> Backup
R3(config-if)#
*Oct 19 18:55:50.973: %VRRP-6-STATECHANGE: Et0/0 Grp 1 state Backup -> Master
R3(config-if)#
*Oct 19 18:55:50.975: %IP-4-DUPADDR: Duplicate address 192.168.100.100 on Ethern
et0/0, sourced by 0000.0c07.ac01
R3(config-if)#
```

```
R3#sh vrrp
Ethernet0/0 - Group 1
  State is Master
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 105
    Track object 2 state Up decrement 10
  Master Router is 192.168.100.96 (local), priority is 105
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.589 sec

R3#
*Oct 19 18:58:23.235: %IP-4-DUPADDR: Duplicate address 192.168.100.100 on Ethern
et0/0, sourced by 0000.0c07.ac01
R3#
```

No Router ativo também aparece:

```
R1#
*Oct 19 18:55:50.974: %IP-4-DUPADDR: Duplicate address 192.168.100.100 on Ethern
et0/0, sourced by 0000.5e00.0101
R1#
*Oct 19 18:56:21.503: %IP-4-DUPADDR: Duplicate address 192.168.100.100 on Ethern
et0/0, sourced by 0000.5e00.0101
R1#
```

File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help

Apply a display filter ... <Ctrl-/>

	Source	Destination	Protocol	Length	Info
4311	All-HSRP-routers_01	Broadcast	ARP	60	Gratuitous ARP for 192.168.100.100 (Reply)
4703	All-HSRP-routers_01	STP-UplinkFast	ARP	60	Gratuitous ARP for 192.168.100.100 (Reply)
7564	192.168.100.96	224.0.0.18	VRRP	60	Announcement (v2)
7830	192.168.100.95	224.0.0.2	HSRP	62	Hello (state Active)
0160	192.168.100.94	224.0.0.2	HSRP	62	Hello (state Standby)
8742	192.168.100.96	224.0.0.18	VRRP	60	Announcement (v2)
1917	IETF-VRRP-VRID_01	Broadcast	ARP	60	Gratuitous ARP for 192.168.100.100 (Reply) (duplicate use of …
2054	IETF-VRRP-VRID_01	STP-UplinkFast	ARP	60	Gratuitous ARP for 192.168.100.100 (Reply) (duplicate use of …
3328	192.168.100.95	224.0.0.2	HSRP	62	Hello (state Active)
3412	All-HSRP-routers_01	Broadcast	ARP	60	Gratuitous ARP for 192.168.100.100 (Reply)
3467	All-HSRP-routers_01	STP-UplinkFast	ARP	60	Gratuitous ARP for 192.168.100.100 (Reply)

```
Frame 127: 60 bytes on wire (480 bits), 60 bytes captured (480 bits) on interface -, id 0
Ethernet II, Src: IETF-VRRP-VRID_01 (00:00:5e:00:01:01), Dst: STP-UplinkFast (01:00:0c:cd:cd:cd)
Address Resolution Protocol (reply/gratuitous ARP)
[Duplicate IP address detected for 192.168.100.100 (00:00:5e:00:01:01) - also in use by 00:00:0c:07:ac:01 (frame 123)]
```

(routers acusarem que já existe um equipamento com o ip virtual, mas os clientes só apanham o serviço de HSRP. (Havendo sempre o envio de pacotes ARP)

4- Configuração sem *priority!* (preempt por omissão)

R1 R2

```
*Oct 19 19:36:29.580: %VRRP-6-STATECHANGE: Et0/0 Grp 1 state Master -> Backup
R1#sh vrr
R1#sh vrrp
Ethernet0/0 - Group 1
  State is Backup
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 2 state Up decrement 10
  Master Router is 192.168.100.95, priority is 100
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.609 sec (expires in 2.990 sec)

Ethernet0/1 - Group 1
  State is Backup
  Virtual IP address is 192.168.200.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 1 state Up decrement 10
```

R1 R2

```
*Oct 19 19:36:29.579: %VRRP-6-STATECHANGE: Et0/1 Grp 1 state Backup -> Master
R2#sh vrr
R2#sh vrrp
Ethernet0/0 - Group 1
  State is Master
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 2 state Up decrement 10
  Master Router is 192.168.100.95 (local), priority is 100
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.609 sec

Ethernet0/1 - Group 1
  State is Master
  Virtual IP address is 192.168.200.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 1 state Up decrement 10
```

Alterar R2 e0/0 para ip virtual 192.168.100.100:

R1 R2

```
Ethernet0/0 - Group 1
  State is Backup
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 2 state Up decrement 10
  Master Router is 192.168.100.100, priority is 255
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.609 sec (expires in 3.488 sec)

Ethernet0/1 - Group 1
  State is Backup
  Virtual IP address is 192.168.200.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 1 state Up decrement 10
  Master Router is 192.168.200.197, priority is 100
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.609 sec (expires in 2.903 sec)
```

R1 R2

```
Ethernet0/0 - Group 1
  State is Master
  Virtual IP address is 192.168.100.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 255
    Track object 2 state Up decrement 10
  Master Router is 192.168.100.100 (local), priority is 255
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.003 sec

Ethernet0/1 - Group 1
  State is Master
  Virtual IP address is 192.168.200.100
  Virtual MAC address is 0000.5e00.0101
  Advertisement interval is 1.000 sec
  Preemption enabled
  Priority is 100
    Track object 1 state Up decrement 10
  Master Router is 192.168.200.197 (local), priority is 100
  Master Advertisement interval is 1.000 sec
  Master Down interval is 3.609 sec
```

NADA MUDOU!!!

EXISTE CONECTIVIDADE ENTRE TERMINAIS!!!

Mudança de propriedade DÁ para ser efetuada, mas não tem efeito!!

```
R2(config-if)#vrrp 1 priority 95
% Priority change will have no effect whilst interface is VRRP address owner
R2(config-if)#
```

(Após mudar o IP virtual para ser igual ao do R2 e.0/0, a prioridade (master) mudou para o R2 e estando nessa prioridade, não é possível desligar a preemption)

Conclusão:

Router que tiver o endereço fisico igual ao endereço Virtual tem a prioridade máxima e não pode ser mudada porque se o Router 1 tiver o endereço ip 10.0.0.1, o Router 2 tiver o endereço 10.0.0.2 e ambos tiverem o 10.0.0.1 como endereço IP virtual o Router 2 se tiver maior prioridade que o Router 1 vai ser possível chegar ao Router 2 pelo endereço 10.0.0.1 mas como o Router 1 está operacional o endereço IP 10.0.0.1 pode ser usado para chegar ao Router 1 logo tens duplicação de endereços IP e perdes a possibilidade de fazer gestão remota ao equipamento.

A vantagem desta abordagem é que se tiveres muitos terminais com a default gateway 10.0.0.1 não tens de estar a mudar porque estás a usar o mesmo endereço para endereço IP virtual.

5-

O AVG é eleito a partir de quem tem maior prioridade e o AVF é eleito a partir de quem tem maior valor no weight.

6- VER PDF 107 ENDPOINT!! IMPOR

R1 e0/0 Active

R1 e0/1 Active

R2 e0/0 Standby

R2 e0/1 Standby

R3 e0/0 Listen

R3 e0/1 Listen

a)

R1 e0/0 Active

R1 e0/1 Down (init)

R2 e0/0 Standby

R2 e0/1 Active

R3 e0/0 Listen

R3 e0/1 Standby

Depois da falha em R1 e0/1, R2 assume o papel de Active em e0/1!

b)

R1 Down

R2 e0/0 Active

R2 e0/1 Active

R3 e0/0 Standby

R3 e0/1 Standby

c)

R2 e0/0 Active

R2 e0/1 Down

R3 e0/0 Standby

R3 e0/1 Active

Depois da falha em R2 e0/1, R3 assumiu o papel de Active em R3 e0/1!!

d)

R1 FICAR UP

R1 e0/0 Active

R1 e0/1 Active

R2 e0/0 Standby

R2 e0/1 Down

R3 e0/0 Listen

R3 e0/1 Standby

R1, voltou a assumir o papel de AVG porque tem a prioridade máxima!