Licenciatura em Engenharia Informática   
Redes de Dados II (2021/2022)

Protocolo IPv4 e IPv6 em modo nativo e em cenários de transição; Encaminhamento baseado em rotas estáticas.

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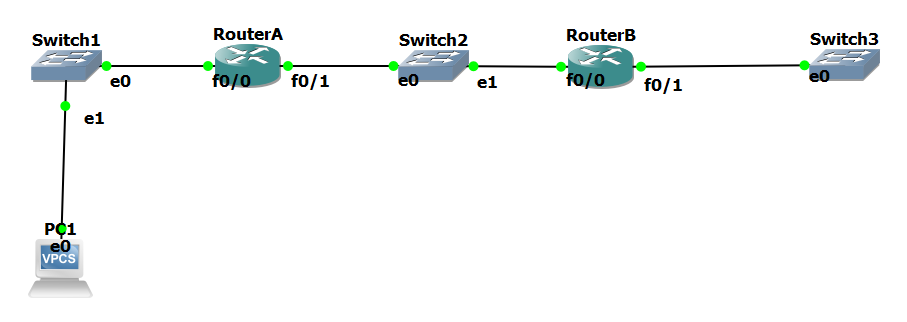
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# Cenário A:

## Tarefa 1:

* Passo 1
* Passo 2

erase startup-config

## Tarefa 2:

1. Hostname RouterA e hostname RouterB
2. No ip domain-lookup
3. Enable secret class
4. banner motd $Proibido acesso a pessoal sem autorização$
5. line console 0

password class

login

1. line vty 0 4

password class

login

## Tarefa 3:

* Passo 1:

Para o router A, por exemplo:

Interface f0/0

ip add 192.168.1.1 255.255.255.0

* Passo 2:

Uma imagem com texto

Descrição gerada automaticamenteRouter A:

Wr => Para guardar as configurações activas na NVRAM.

Uma imagem com texto

Descrição gerada automaticamenteRouter B:

Wr => Para guardar as configurações activas na NVRAM.

* Passo 3:

PC1> ip 192.168.1.100 255.255.255.0 192.168.1.1

Checking for duplicate address...

PC1 : 192.168.1.100 255.255.255.0 gateway 192.168.1.1

* Passo 4:

Uma imagem com texto, interior, preto, teclado

Descrição gerada automaticamente

* Passo 5: Não existe conectividade, pois na tabela de encaminhamento do router B não aparece o enderenço do PC, logo o(s) pacote(s) são descartados
* Passo 6: Envolver rotas estáticas

Para o Router A:

ip route 192.168.51.0 255.255.255.0 192.168.21.2

Para o Router B:

ip route 192.168.1.0 255.255.255.0 192.168.21.1

ip route 192.168.21.0 255.255.255.0 192.168.21.1

Uma imagem com texto

Descrição gerada automaticamente Depois de efetuar as rotas estáticas o ping do Router B para o pc já é bem-sucedido

## Ficheiros e comandos do Router A:

### Running-config:

Building configuration...

Current configuration : 1331 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

service password-encryption

!

hostname RouterA

!

boot-start-marker

boot-end-marker

!

enable secret 5 $1$i/nX$ORYPfMM0ZgMmY2.zS9zn80

enable password 7 070C285F4D06

!

no aaa new-model

memory-size iomem 5

no ip icmp rate-limit unreachable

ip cef

!

!

!

!

no ip domain lookup

ip auth-proxy max-nodata-conns 3

ip admission max-nodata-conns 3

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

ip tcp synwait-time 5

!

!

!

!

!

interface FastEthernet0/0

ip address 192.168.1.1 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 192.168.21.1 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

shutdown

duplex auto

speed auto

!

ip forward-protocol nd

ip route 192.168.51.0 255.255.255.0 192.168.21.2

!

!

no ip http server

no ip http secure-server

!

no cdp log mismatch duplex

!

!

!

control-plane

!

!

!

!

!

!

!

!

!

banner motd ^CAcesso nao autorizado a pessoas desconhecidas^C

!

line con 0

exec-timeout 0 0

privilege level 15

password 7 121A0C041104

logging synchronous

login

line aux 0

exec-timeout 0 0

privilege level 15

logging synchronous

line vty 0 4

password 7 0822455D0A16

login

!

!

end

### Show ip route:

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.21.0/24 is directly connected, FastEthernet0/1

S 192.168.51.0/24 [1/0] via 192.168.21.2

C 192.168.1.0/24 is directly connected, FastEthernet0/0

### Show ip traffic:

IP statistics:

Rcvd: 95 total, 65 local destination

0 format errors, 0 checksum errors, 0 bad hop count

0 unknown protocol, 0 not a gateway

0 security failures, 0 bad options, 0 with options

Opts: 0 end, 0 nop, 0 basic security, 0 loose source route

0 timestamp, 0 extended security, 0 record route

0 stream ID, 0 strict source route, 0 alert, 0 cipso, 0 ump

0 other

Frags: 0 reassembled, 0 timeouts, 0 couldn't reassemble

0 fragmented, 0 fragments, 0 couldn't fragment

Bcast: 15 received, 0 sent

Mcast: 0 received, 0 sent

Sent: 64 generated, 30 forwarded

Drop: 6 encapsulation failed, 0 unresolved, 0 no adjacency

0 no route, 0 unicast RPF, 0 forced drop

0 options denied

Drop: 0 packets with source IP address zero

Drop: 0 packets with internal loop back IP address

0 physical broadcast

ICMP statistics:

Rcvd: 0 format errors, 0 checksum errors, 0 redirects, 0 unreachable

35 echo, 30 echo reply, 0 mask requests, 0 mask replies, 0 quench

0 parameter, 0 timestamp, 0 info request, 0 other

0 irdp solicitations, 0 irdp advertisements

Sent: 0 redirects, 0 unreachable, 40 echo, 35 echo reply

0 mask requests, 0 mask replies, 0 quench, 0 timestamp

0 info reply, 0 time exceeded, 0 parameter problem

0 irdp solicitations, 0 irdp advertisements

TCP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total

BGP statistics:

Rcvd: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh, 0 unrecognized

Sent: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh

IP-EIGRP statistics:

Rcvd: 0 total

Sent: 0 total

PIMv2 statistics: Sent/Received

Total: 0/0, 0 checksum errors, 0 format errors

Registers: 0/0 (0 non-rp, 0 non-sm-group), Register Stops: 0/0, Hellos: 0/0

Join/Prunes: 0/0, Asserts: 0/0, grafts: 0/0

Bootstraps: 0/0, Candidate\_RP\_Advertisements: 0/0

Queue drops: 0

State-Refresh: 0/0

IGMP statistics: Sent/Received

Total: 0/0, Format errors: 0/0, Checksum errors: 0/0

Host Queries: 0/0, Host Reports: 0/0, Host Leaves: 0/0

DVMRP: 0/0, PIM: 0/0

Queue drops: 0

UDP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total, 0 forwarded broadcasts

OSPF statistics:

Rcvd: 0 total, 0 checksum errors

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

Sent: 0 total

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

ARP statistics:

Rcvd: 7 requests, 1 replies, 0 reverse, 0 other

Sent: 6 requests, 8 replies (0 proxy), 0 reverse

## Ficheiros e comandos do Router B:

### Running-config:

Building configuration...

Current configuration : 1221 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

service password-encryption

!

hostname RouterB

!

boot-start-marker

boot-end-marker

!

enable secret 5 $1$g6GJ$nOqY.pkZsya2DWoi0Yi561

!

no aaa new-model

memory-size iomem 5

no ip icmp rate-limit unreachable

ip cef

!

!

!

!

no ip domain lookup

ip auth-proxy max-nodata-conns 3

ip admission max-nodata-conns 3

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

ip tcp synwait-time 5

!

!

!

!

!

interface FastEthernet0/0

ip address 192.168.21.2 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet0/1

ip address 192.168.51.1 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

shutdown

duplex auto

speed auto

!

ip forward-protocol nd

ip route 192.168.1.0 255.255.255.0 192.168.21.1

ip route 192.168.21.0 255.255.255.0 192.168.21.1

!

!

no ip http server

no ip http secure-server

!

no cdp log mismatch duplex

!

!

!

control-plane

!

!

!

!

!

!

!

!

!

banner motd ^CAcesso restrito^C

!

line con 0

exec-timeout 0 0

privilege level 15

password 7 13061B13181F

logging synchronous

login

line aux 0

exec-timeout 0 0

privilege level 15

logging synchronous

line vty 0 4

password 7 01100A054818

login

!

!

end

### Show ip route:

show ip route

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.21.0/24 is directly connected, FastEthernet0/0

C 192.168.51.0/24 is directly connected, FastEthernet0/1

S 192.168.1.0/24 [1/0] via 192.168.21.1

### Show ip traffic:

IP statistics:

Rcvd: 69 total, 69 local destination

0 format errors, 0 checksum errors, 0 bad hop count

0 unknown protocol, 0 not a gateway

0 security failures, 0 bad options, 0 with options

Opts: 0 end, 0 nop, 0 basic security, 0 loose source route

0 timestamp, 0 extended security, 0 record route

0 stream ID, 0 strict source route, 0 alert, 0 cipso, 0 ump

0 other

Frags: 0 reassembled, 0 timeouts, 0 couldn't reassemble

0 fragmented, 0 fragments, 0 couldn't fragment

Bcast: 0 received, 15 sent

Mcast: 0 received, 0 sent

Sent: 70 generated, 0 forwarded

Drop: 5 encapsulation failed, 0 unresolved, 0 no adjacency

0 no route, 0 unicast RPF, 0 forced drop

0 options denied

Drop: 0 packets with source IP address zero

Drop: 0 packets with internal loop back IP address

0 physical broadcast

ICMP statistics:

Rcvd: 0 format errors, 0 checksum errors, 0 redirects, 0 unreachable

30 echo, 39 echo reply, 0 mask requests, 0 mask replies, 0 quench

0 parameter, 0 timestamp, 0 info request, 0 other

0 irdp solicitations, 0 irdp advertisements

Sent: 0 redirects, 0 unreachable, 50 echo, 30 echo reply

0 mask requests, 0 mask replies, 0 quench, 0 timestamp

0 info reply, 0 time exceeded, 0 parameter problem

0 irdp solicitations, 0 irdp advertisements

TCP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total

BGP statistics:

Rcvd: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh, 0 unrecognized

Sent: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh

IP-EIGRP statistics:

Rcvd: 0 total

Sent: 0 total

PIMv2 statistics: Sent/Received

Total: 0/0, 0 checksum errors, 0 format errors

Registers: 0/0 (0 non-rp, 0 non-sm-group), Register Stops: 0/0, Hellos: 0/0

Join/Prunes: 0/0, Asserts: 0/0, grafts: 0/0

Bootstraps: 0/0, Candidate\_RP\_Advertisements: 0/0

Queue drops: 0

State-Refresh: 0/0

IGMP statistics: Sent/Received

Total: 0/0, Format errors: 0/0, Checksum errors: 0/0

Host Queries: 0/0, Host Reports: 0/0, Host Leaves: 0/0

DVMRP: 0/0, PIM: 0/0

Queue drops: 0

UDP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total, 0 forwarded broadcasts

OSPF statistics:

Rcvd: 0 total, 0 checksum errors

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

Sent: 0 total

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

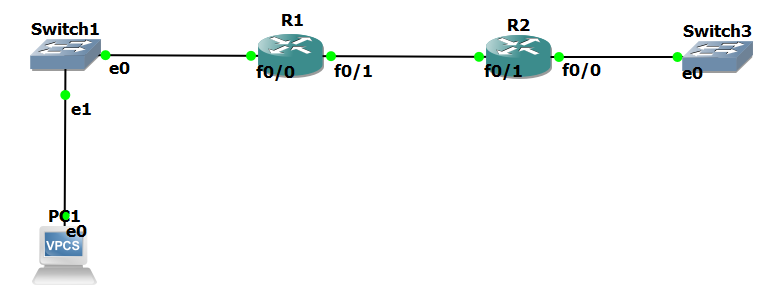
ARP statistics:

Rcvd: 1 requests, 0 replies, 0 reverse, 0 other

Sent: 5 requests, 5 replies (0 proxy), 0 reverse

# Cenário B:

## Tarefa 1:

* Passo 1:
* Passo 2:

Para ambos os Routers:

Default interface f0/0

Default interface f0/1

## Tarefa 2:

* Passo 1:

Para o Router B, por exemplo:

Conf t

Interface f0/0

Ipv6 add 2001:690:2121:51::1/64

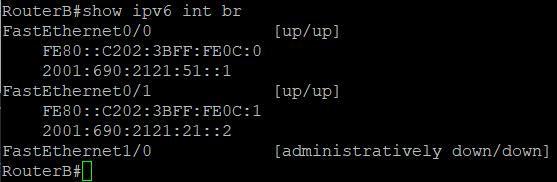
* Passo 2:

Para o Router A:

Uma imagem com texto

Descrição gerada automaticamente

Para o Router B:



* Passo 3:

ipv6 nd prefix 2001:690:2121:1::1/64

ipv6 nd ra-lifetime 300

Uma imagem com texto

Descrição gerada automaticamente

RouterA#debug ipv6 nd

ICMP Neighbor Discovery events debugging is on

RouterA#

\*Mar 1 00:41:02.363: ICMPv6-ND: Received RA from FE80::C202:3BFF:FE0C:1 on FastEthernet0/1

RouterA#

\*Mar 1 00:41:05.711: ICMPv6-ND: Sending RA to FF02::1 on FastEthernet0/1

\*Mar 1 00:41:05.711: ICMPv6-ND: MTU = 1500

\*Mar 1 00:41:05.711: ICMPv6-ND: prefix = 2001:690:2121:21::/64 onlink autoconfig

\*Mar 1 00:41:05.711: ICMPv6-ND: 2592000/604800 (valid/preferred)

RouterA#

\*Mar 1 00:41:24.627: ICMPv6-ND: Sending RA to FF02::1 on FastEthernet0/0

\*Mar 1 00:41:24.627: ICMPv6-ND: MTU = 1500

\*Mar 1 00:41:24.627: ICMPv6-ND: prefix = 2001:690:2121:1::/64 onlink autoconfig

\*Mar 1 00:41:24.627: ICMPv6-ND: 2592000/604800 (valid/preferred)

* Uma imagem com texto

  Descrição gerada automaticamentePasso 4:

Está atribuido 1 enderenço IPv6

O fe80::250:79ff:fe66:6800/64 é o link local address

O 2001:690:2121:1:2050:79ff:fe66:6800/64 eui-64 é o global address

O link local address e o global address foram obtidos automaticamente.

* Passo 5:

Uma imagem com texto

Descrição gerada automaticamente

Existe conectividade.

* Passo 6: Não existe conectividade pois na tabela de encaminhamento do router A não aparece o enderenço do router B, logo o(s) pacote(s) são descartados.
* Passo 7: Envolver rotas estáticas

Para o Router A:

ipv6 route 2001:690:2121:51::/64 2001:690:2121:21::2

Para o Router B:

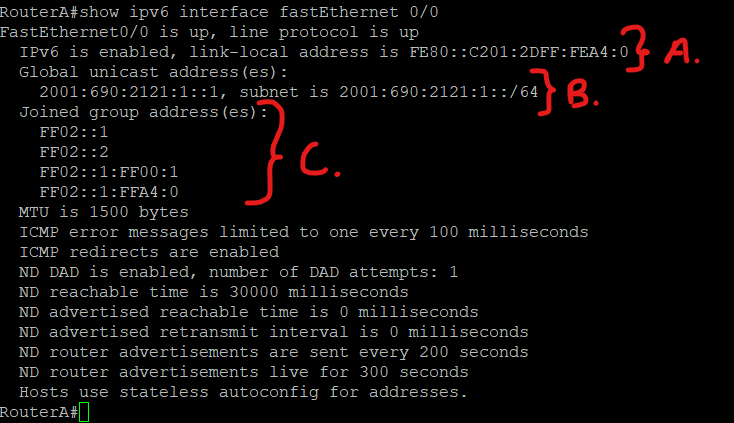
ipv6 route 2001:690:2121:1::/64 2001:690:2121:21::1

Depois de fazer esses comandos o ping é bem-sucedido, garantindo conectividade.

Uma imagem com texto

Descrição gerada automaticamente

## Tarefa 3:

* Passo 1:

1. Link Local Address
2. Global Unicast Address
3. Multicast

* Passo 2:

RouterA# clear ipv6 neighbors

RouterB# clear ipv6 neighbors

## Ficheiros e comandos do Router A:

### Running-config:

RouterA#show running-config

Building configuration...

Current configuration : 1346 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

service password-encryption

!

hostname RouterA

!

boot-start-marker

boot-end-marker

!

enable secret 5 $1$i/nX$ORYPfMM0ZgMmY2.zS9zn80

enable password 7 070C285F4D06

!

no aaa new-model

memory-size iomem 5

no ip icmp rate-limit unreachable

ip cef

!

!

!

!

no ip domain lookup

ip auth-proxy max-nodata-conns 3

ip admission max-nodata-conns 3

!

ipv6 unicast-routing

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

ip tcp synwait-time 5

!

!

!

!

!

interface FastEthernet0/0

no ip address

duplex auto

speed auto

ipv6 address 2001:690:2121:1::1/64

ipv6 nd ra-lifetime 300

ipv6 nd prefix 2001:690:2121:1::/64

!

interface FastEthernet0/1

no ip address

duplex auto

speed auto

ipv6 address 2001:690:2121:21::1/64

!

interface FastEthernet1/0

no ip address

shutdown

duplex auto

speed auto

!

ip forward-protocol nd

!

!

no ip http server

no ip http secure-server

!

no cdp log mismatch duplex

ipv6 route 2001:690:2121:51::/64 2001:690:2121:21::2

!

!

!

control-plane

!

!

!

!

!

!

!

!

!

banner motd ^CAcesso nao autorizado a pessoas desconhecidas^C

!

line con 0

exec-timeout 0 0

privilege level 15

password 7 121A0C041104

logging synchronous

login

line aux 0

exec-timeout 0 0

privilege level 15

logging synchronous

line vty 0 4

password 7 0822455D0A16

login

!

!

end

### Show ipv6 route:

RouterA#show ipv6 route

IPv6 Routing Table - 7 entries

Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP

U - Per-user Static route

I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary

O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2

C 2001:690:2121:1::/64 [0/0]

via ::, FastEthernet0/0

L 2001:690:2121:1::1/128 [0/0]

via ::, FastEthernet0/0

C 2001:690:2121:21::/64 [0/0]

via ::, FastEthernet0/1

L 2001:690:2121:21::1/128 [0/0]

via ::, FastEthernet0/1

S 2001:690:2121:51::/64 [1/0]

via 2001:690:2121:21::2

L FE80::/10 [0/0]

via ::, Null0

L FF00::/8 [0/0]

via ::, Null0

### Show ipv6 traffic:

RouterA#show ipv6 traffic

IPv6 statistics:

Rcvd: 33 total, 23 local destination

0 source-routed, 0 truncated

0 format errors, 0 hop count exceeded

0 bad header, 0 unknown option, 0 bad source

0 unknown protocol, 0 not a router

0 fragments, 0 total reassembled

0 reassembly timeouts, 0 reassembly failures

0 unicast RPF drop, 0 suppressed RPF drop

Sent: 68 generated, 10 forwarded

0 fragmented into 0 fragments, 0 failed

0 encapsulation failed, 0 no route, 0 too big

Mcast: 14 received, 56 sent

ICMP statistics:

Rcvd: 23 input, 0 checksum errors, 0 too short

0 unknown info type, 0 unknown error type

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

5 echo request, 0 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 10 router advert, 0 redirects

3 neighbor solicit, 5 neighbor advert

Sent: 42 output, 0 rate-limited

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

0 echo request, 5 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 20 router advert, 0 redirects

10 neighbor solicit, 7 neighbor advert

UDP statistics:

Rcvd: 0 input, 0 checksum errors, 0 length errors

0 no port, 0 dropped

Sent: 0 output

TCP statistics:

Rcvd: 0 input, 0 checksum errors

Sent: 0 output, 0 retransmitted

## Ficheiros e comandos do Router B:

### Running-config:

RouterB#show running-config

Building configuration...

Current configuration : 1284 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

service password-encryption

!

hostname RouterB

!

boot-start-marker

boot-end-marker

!

enable secret 5 $1$i/nX$ORYPfMM0ZgMmY2.zS9zn80

enable password 7 070C285F4D06

!

no aaa new-model

memory-size iomem 5

no ip icmp rate-limit unreachable

ip cef

!

!

!

!

no ip domain lookup

ip auth-proxy max-nodata-conns 3

ip admission max-nodata-conns 3

!

ipv6 unicast-routing

!

!

!

!

!

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!

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!

!

!

!

!

!

!

!

ip tcp synwait-time 5

!

!

!

!

!

interface FastEthernet0/0

no ip address

duplex auto

speed auto

ipv6 address 2001:690:2121:51::1/64

!

interface FastEthernet0/1

no ip address

duplex auto

speed auto

ipv6 address 2001:690:2121:21::2/64

!

interface FastEthernet1/0

no ip address

shutdown

duplex auto

speed auto

!

ip forward-protocol nd

!

!

no ip http server

no ip http secure-server

!

no cdp log mismatch duplex

ipv6 route 2001:690:2121:1::/64 2001:690:2121:21::1

!

!

!

control-plane

!

!

!

!

!

!

!

!

!

banner motd ^CAcesso nao autorizado a pessoas desconhecidas^C

!

line con 0

exec-timeout 0 0

privilege level 15

password 7 121A0C041104

logging synchronous

login

line aux 0

exec-timeout 0 0

privilege level 15

logging synchronous

line vty 0 4

password 7 0822455D0A16

login

!

!

end

### Show ipv6 route:

RouterB#show ipv6 route

IPv6 Routing Table - 7 entries

Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP

U - Per-user Static route

I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary

O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2

S 2001:690:2121:1::/64 [1/0]

via 2001:690:2121:21::1

C 2001:690:2121:21::/64 [0/0]

via ::, FastEthernet0/1

L 2001:690:2121:21::2/128 [0/0]

via ::, FastEthernet0/1

C 2001:690:2121:51::/64 [0/0]

via ::, FastEthernet0/0

L 2001:690:2121:51::1/128 [0/0]

via ::, FastEthernet0/0

L FE80::/10 [0/0]

via ::, Null0

L FF00::/8 [0/0]

via ::, Null0

### Show ipv6 traffic:

RouterB#show ipv6 traffic

IPv6 statistics:

Rcvd: 22 total, 22 local destination

0 source-routed, 0 truncated

0 format errors, 0 hop count exceeded

0 bad header, 0 unknown option, 0 bad source

0 unknown protocol, 0 not a router

0 fragments, 0 total reassembled

0 reassembly timeouts, 0 reassembly failures

0 unicast RPF drop, 0 suppressed RPF drop

Sent: 65 generated, 0 forwarded

0 fragmented into 0 fragments, 0 failed

0 encapsulation failed, 0 no route, 0 too big

Mcast: 14 received, 57 sent

ICMP statistics:

Rcvd: 22 input, 0 checksum errors, 0 too short

0 unknown info type, 0 unknown error type

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

5 echo request, 0 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 11 router advert, 0 redirects

2 neighbor solicit, 4 neighbor advert

Sent: 39 output, 0 rate-limited

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

0 echo request, 5 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 22 router advert, 0 redirects

6 neighbor solicit, 6 neighbor advert

UDP statistics:

Rcvd: 0 input, 0 checksum errors, 0 length errors

0 no port, 0 dropped

Sent: 0 output

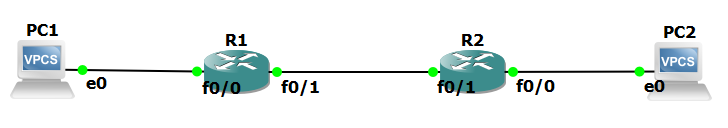
TCP statistics:

Rcvd: 0 input, 0 checksum errors

Sent: 0 output, 0 retransmitted

# Cenário C:

## Tarefa 1:

* Passo 1:

## Tarefa 2:

* Passo 1:

Para o router B, por exemplo:

Conf t

Interface f0/0

2001:690:2121:51::1/64

* Passo 2:

Para o Router A:

Uma imagem com texto

Descrição gerada automaticamente

Para o Router B:

Uma imagem com texto

Descrição gerada automaticamente

* Passo 3:

Router A:

Interface tunnel 0

Ipv6 address 2001:690:2121:24::1/64

Tunnel source f0/1

Tunnel destination 192.168.21.2

Tunnel mode ipv6ip

Uma imagem com texto

Descrição gerada automaticamente Ipv6 route 2001:690:2121:54::/64 2001:690:2121:24::2

Router B:

Interface tunnel 0

Ipv6 address 2001:690:2121:24::2/64

Tunnel source f0/1

Tunnel destination 192.168.21.1

Tunnel mode ipv6ip

Ipv6 route 2001:690:2121:1::/64 2001:690:2121:24::1

Uma imagem com texto

Descrição gerada automaticamente

* Passo 4:

Uma imagem com texto

Descrição gerada automaticamente

Uma imagem com texto

Descrição gerada automaticamente

## Ficheiros e comandos do Router A:

### Running-config:

RouterA#show running-config

Building configuration...

Current configuration : 1214 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname RouterA

!

boot-start-marker

boot-end-marker

!

!

no aaa new-model

memory-size iomem 5

no ip icmp rate-limit unreachable

ip cef

!

!

!

!

no ip domain lookup

ip auth-proxy max-nodata-conns 3

ip admission max-nodata-conns 3

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

ip tcp synwait-time 5

!

!

!

!

!

interface Tunnel0

no ip address

ipv6 address 2001:690:2121:24::1/64

tunnel source FastEthernet0/1

tunnel destination 192.168.21.2

tunnel mode ipv6ip

!

interface FastEthernet0/0

no ip address

duplex auto

speed auto

ipv6 address 2001:690:2121:1::1/64

!

interface FastEthernet0/1

ip address 192.168.21.1 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

shutdown

duplex auto

speed auto

!

ip forward-protocol nd

!

!

no ip http server

no ip http secure-server

!

no cdp log mismatch duplex

ipv6 route 2001:690:2121:54::/64 2001:690:2121:24::2

!

!

!

control-plane

!

!

!

!

!

!

!

!

!

!

line con 0

exec-timeout 0 0

privilege level 15

logging synchronous

line aux 0

exec-timeout 0 0

privilege level 15

logging synchronous

line vty 0 4

login

!

!

end

### Show ip route:

RouterA#show ip route

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.21.0/24 is directly connected, FastEthernet0/1

### Show ipv6 route:

RouterA#show ipv6 route

IPv6 Routing Table - 7 entries

Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP

U - Per-user Static route

I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary

O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2

C 2001:690:2121:1::/64 [0/0]

via ::, FastEthernet0/0

L 2001:690:2121:1::1/128 [0/0]

via ::, FastEthernet0/0

C 2001:690:2121:24::/64 [0/0]

via ::, Tunnel0

L 2001:690:2121:24::1/128 [0/0]

via ::, Tunnel0

S 2001:690:2121:54::/64 [1/0]

via 2001:690:2121:24::2

L FE80::/10 [0/0]

via ::, Null0

L FF00::/8 [0/0]

via ::, Null0

### Show ip traffic:

RouterA#show ip traffic

IP statistics:

Rcvd: 27 total, 27 local destination

0 format errors, 0 checksum errors, 0 bad hop count

0 unknown protocol, 0 not a gateway

0 security failures, 0 bad options, 0 with options

Opts: 0 end, 0 nop, 0 basic security, 0 loose source route

0 timestamp, 0 extended security, 0 record route

0 stream ID, 0 strict source route, 0 alert, 0 cipso, 0 ump

0 other

Frags: 0 reassembled, 0 timeouts, 0 couldn't reassemble

0 fragmented, 0 fragments, 0 couldn't fragment

Bcast: 0 received, 0 sent

Mcast: 0 received, 0 sent

Sent: 15 generated, 0 forwarded

Drop: 5 encapsulation failed, 0 unresolved, 0 no adjacency

0 no route, 0 unicast RPF, 0 forced drop

0 options denied

Drop: 0 packets with source IP address zero

Drop: 0 packets with internal loop back IP address

0 physical broadcast

ICMP statistics:

Rcvd: 0 format errors, 0 checksum errors, 0 redirects, 0 unreachable

5 echo, 10 echo reply, 0 mask requests, 0 mask replies, 0 quench

0 parameter, 0 timestamp, 0 info request, 0 other

0 irdp solicitations, 0 irdp advertisements

Sent: 0 redirects, 0 unreachable, 10 echo, 5 echo reply

0 mask requests, 0 mask replies, 0 quench, 0 timestamp

0 info reply, 0 time exceeded, 0 parameter problem

0 irdp solicitations, 0 irdp advertisements

TCP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total

BGP statistics:

Rcvd: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh, 0 unrecognized

Sent: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh

IP-EIGRP statistics:

Rcvd: 0 total

Sent: 0 total

PIMv2 statistics: Sent/Received

Total: 0/0, 0 checksum errors, 0 format errors

Registers: 0/0 (0 non-rp, 0 non-sm-group), Register Stops: 0/0, Hellos: 0/0

Join/Prunes: 0/0, Asserts: 0/0, grafts: 0/0

Bootstraps: 0/0, Candidate\_RP\_Advertisements: 0/0

Queue drops: 0

State-Refresh: 0/0

IGMP statistics: Sent/Received

Total: 0/0, Format errors: 0/0, Checksum errors: 0/0

Host Queries: 0/0, Host Reports: 0/0, Host Leaves: 0/0

DVMRP: 0/0, PIM: 0/0

Queue drops: 0

UDP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total, 0 forwarded broadcasts

OSPF statistics:

Rcvd: 0 total, 0 checksum errors

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

Sent: 0 total

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

ARP statistics:

Rcvd: 1 requests, 4 replies, 0 reverse, 0 other

Sent: 1 requests, 4 replies (0 proxy), 0 reverse

### Show ipv6 traffic:

RouterA#show ipv6 traffic

IPv6 statistics:

Rcvd: 12 total, 2 local destination

0 source-routed, 0 truncated

0 format errors, 0 hop count exceeded

0 bad header, 0 unknown option, 0 bad source

0 unknown protocol, 0 not a router

0 fragments, 0 total reassembled

0 reassembly timeouts, 0 reassembly failures

0 unicast RPF drop, 0 suppressed RPF drop

Sent: 34 generated, 0 forwarded

0 fragmented into 0 fragments, 0 failed

0 encapsulation failed, 2 no route, 0 too big

Mcast: 12 received, 34 sent

ICMP statistics:

Rcvd: 10 input, 0 checksum errors, 0 too short

0 unknown info type, 0 unknown error type

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

0 echo request, 0 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 0 router advert, 0 redirects

0 neighbor solicit, 2 neighbor advert

Sent: 8 output, 0 rate-limited

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

0 echo request, 0 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 0 router advert, 0 redirects

4 neighbor solicit, 4 neighbor advert

UDP statistics:

Rcvd: 0 input, 0 checksum errors, 0 length errors

0 no port, 0 dropped

Sent: 0 output

TCP statistics:

Rcvd: 0 input, 0 checksum errors

Sent: 0 output, 0 retransmitted

## Ficheiros e comandos do Router B:

### Running-config:

RouterB#show running-config

Building configuration...

Current configuration : 1212 bytes

!

version 12.4

service timestamps debug datetime msec

service timestamps log datetime msec

no service password-encryption

!

hostname RouterB

!

boot-start-marker

boot-end-marker

!

!

no aaa new-model

memory-size iomem 5

no ip icmp rate-limit unreachable

ip cef

!

!

!

!

no ip domain lookup

ip auth-proxy max-nodata-conns 3

ip admission max-nodata-conns 3

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

!

ip tcp synwait-time 5

!

!

!

!

!

interface Tunnel0

no ip address

ipv6 address 2001:690:2121:24::2/64

tunnel source FastEthernet0/1

tunnel destination 192.168.21.1

tunnel mode ipv6ip

!

interface FastEthernet0/0

no ip address

duplex auto

speed auto

ipv6 address 2001:690:2121:51::1/64

!

interface FastEthernet0/1

ip address 192.168.21.2 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

shutdown

duplex auto

speed auto

!

ip forward-protocol nd

!

!

no ip http server

no ip http secure-server

!

no cdp log mismatch duplex

ipv6 route 2001:690:2121::/64 2001:690:2121:24::1

!

!

!

control-plane

!

!

!

!

!

!

!

!

!

!

line con 0

exec-timeout 0 0

privilege level 15

logging synchronous

line aux 0

exec-timeout 0 0

privilege level 15

logging synchronous

line vty 0 4

login

!

!

End

### Show ip route:

RouterB#show ip route

Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2

i - IS-IS, su - IS-IS summary, L1 - IS-IS level-1, L2 - IS-IS level-2

ia - IS-IS inter area, \* - candidate default, U - per-user static route

o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

C 192.168.21.0/24 is directly connected, FastEthernet0/1

### Show ipv6 route:

RouterB#show ipv6 route

IPv6 Routing Table - 7 entries

Codes: C - Connected, L - Local, S - Static, R - RIP, B - BGP

U - Per-user Static route

I1 - ISIS L1, I2 - ISIS L2, IA - ISIS interarea, IS - ISIS summary

O - OSPF intra, OI - OSPF inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2

S 2001:690:2121::/64 [1/0]

via 2001:690:2121:24::1

C 2001:690:2121:24::/64 [0/0]

via ::, Tunnel0

L 2001:690:2121:24::2/128 [0/0]

via ::, Tunnel0

C 2001:690:2121:51::/64 [0/0]

via ::, FastEthernet0/0

L 2001:690:2121:51::1/128 [0/0]

via ::, FastEthernet0/0

L FE80::/10 [0/0]

via ::, Null0

L FF00::/8 [0/0]

via ::, Null0

### Show ip traffic:

RouterB#show ip traffic

IP statistics:

Rcvd: 27 total, 27 local destination

0 format errors, 0 checksum errors, 0 bad hop count

0 unknown protocol, 0 not a gateway

0 security failures, 0 bad options, 0 with options

Opts: 0 end, 0 nop, 0 basic security, 0 loose source route

0 timestamp, 0 extended security, 0 record route

0 stream ID, 0 strict source route, 0 alert, 0 cipso, 0 ump

0 other

Frags: 0 reassembled, 0 timeouts, 0 couldn't reassemble

0 fragmented, 0 fragments, 0 couldn't fragment

Bcast: 0 received, 0 sent

Mcast: 0 received, 0 sent

Sent: 15 generated, 0 forwarded

Drop: 5 encapsulation failed, 0 unresolved, 0 no adjacency

0 no route, 0 unicast RPF, 0 forced drop

0 options denied

Drop: 0 packets with source IP address zero

Drop: 0 packets with internal loop back IP address

0 physical broadcast

ICMP statistics:

Rcvd: 0 format errors, 0 checksum errors, 0 redirects, 0 unreachable

10 echo, 5 echo reply, 0 mask requests, 0 mask replies, 0 quench

0 parameter, 0 timestamp, 0 info request, 0 other

0 irdp solicitations, 0 irdp advertisements

Sent: 0 redirects, 0 unreachable, 5 echo, 10 echo reply

0 mask requests, 0 mask replies, 0 quench, 0 timestamp

0 info reply, 0 time exceeded, 0 parameter problem

0 irdp solicitations, 0 irdp advertisements

TCP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total

BGP statistics:

Rcvd: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh, 0 unrecognized

Sent: 0 total, 0 opens, 0 notifications, 0 updates

0 keepalives, 0 route-refresh

IP-EIGRP statistics:

Rcvd: 0 total

Sent: 0 total

PIMv2 statistics: Sent/Received

Total: 0/0, 0 checksum errors, 0 format errors

Registers: 0/0 (0 non-rp, 0 non-sm-group), Register Stops: 0/0, Hellos: 0/0

Join/Prunes: 0/0, Asserts: 0/0, grafts: 0/0

Bootstraps: 0/0, Candidate\_RP\_Advertisements: 0/0

Queue drops: 0

State-Refresh: 0/0

IGMP statistics: Sent/Received

Total: 0/0, Format errors: 0/0, Checksum errors: 0/0

Host Queries: 0/0, Host Reports: 0/0, Host Leaves: 0/0

DVMRP: 0/0, PIM: 0/0

Queue drops: 0

UDP statistics:

Rcvd: 0 total, 0 checksum errors, 0 no port

Sent: 0 total, 0 forwarded broadcasts

OSPF statistics:

Rcvd: 0 total, 0 checksum errors

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

Sent: 0 total

0 hello, 0 database desc, 0 link state req

0 link state updates, 0 link state acks

ARP statistics:

Rcvd: 1 requests, 4 replies, 0 reverse, 0 other

Sent: 1 requests, 4 replies (0 proxy), 0 reverse

### Show ipv6 traffic:

RouterB#show ipv6 traffic

IPv6 statistics:

Rcvd: 12 total, 2 local destination

0 source-routed, 0 truncated

0 format errors, 0 hop count exceeded

0 bad header, 0 unknown option, 0 bad source

0 unknown protocol, 0 not a router

0 fragments, 0 total reassembled

0 reassembly timeouts, 0 reassembly failures

0 unicast RPF drop, 0 suppressed RPF drop

Sent: 34 generated, 0 forwarded

0 fragmented into 0 fragments, 0 failed

0 encapsulation failed, 2 no route, 0 too big

Mcast: 12 received, 34 sent

ICMP statistics:

Rcvd: 10 input, 0 checksum errors, 0 too short

0 unknown info type, 0 unknown error type

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

0 echo request, 0 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 0 router advert, 0 redirects

0 neighbor solicit, 2 neighbor advert

Sent: 8 output, 0 rate-limited

unreach: 0 routing, 0 admin, 0 neighbor, 0 address, 0 port

parameter: 0 error, 0 header, 0 option

0 hopcount expired, 0 reassembly timeout,0 too big

0 echo request, 0 echo reply

0 group query, 0 group report, 0 group reduce

0 router solicit, 0 router advert, 0 redirects

4 neighbor solicit, 4 neighbor advert

UDP statistics:

Rcvd: 0 input, 0 checksum errors, 0 length errors

0 no port, 0 dropped

Sent: 0 output

TCP statistics:

Rcvd: 0 input, 0 checksum errors

Sent: 0 output, 0 retransmitted