ATIVIDADE SISTEMAS OPERACIONAIS DE REDES II

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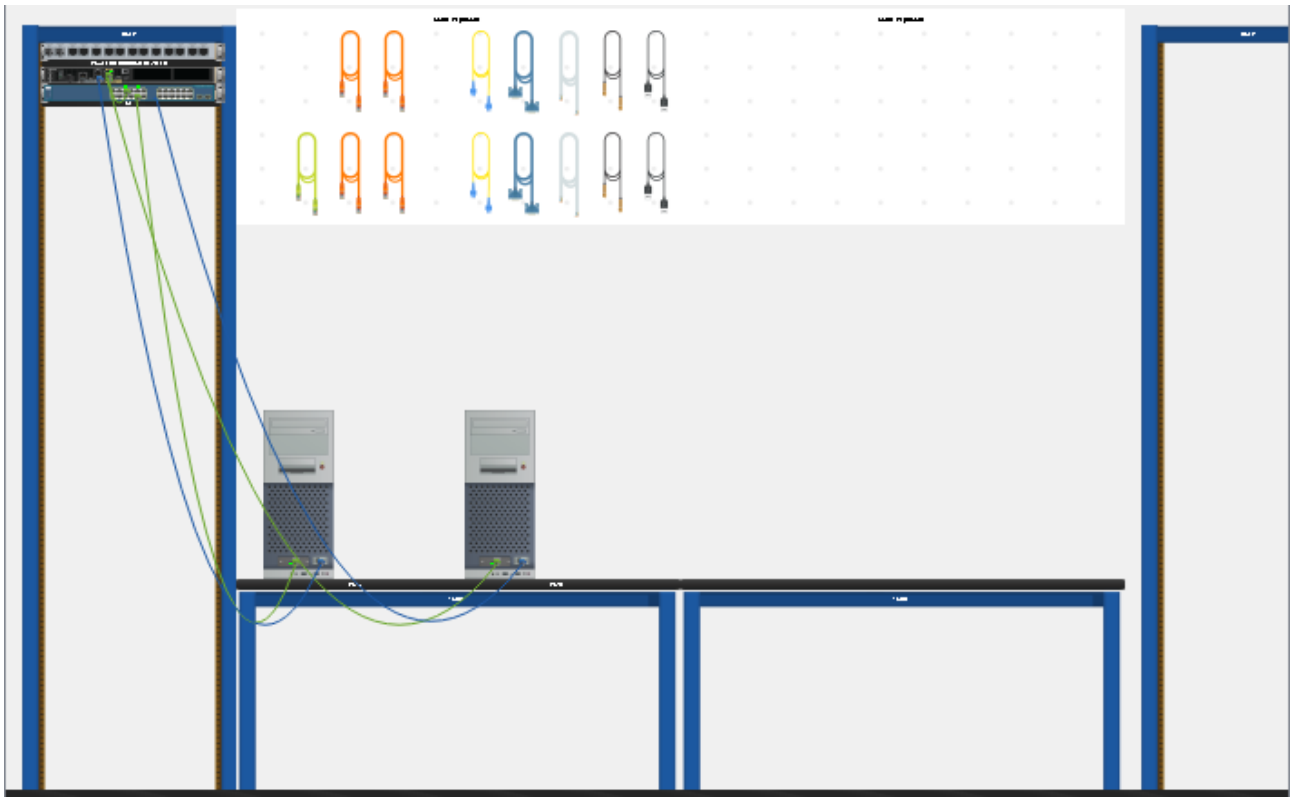
INSTRUÇÕES:

PARTE 1: Cabear a rede e definir configurações básicas de roteador e switch

Etapa 1 – Ligue a rede e ligue os dispositivos:



Etapa 2 – Configure o roteador:

```
Router>enable
Router#config
Configuring from terminal, memory, or network [terminal]? terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname R1
```

Etapa 3 – Configure o switch:

```
Switch>enable
Switch#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#hostname S1
S1(config)#
```

PARTE 2: Configurar endereços IPV6 manualmente

Etapa 1 – Atribua endereços IPV6 às interfaces Ethernet do R1:

a.

```
R1(config)#int g0/0/0
R1(config-if)#ipv6 address 2001:db8:acad:a::1/64
R1(config-if)#no shutdown

R1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0/0, changed sta

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEther

R1(config-if)#int g0/0/1
R1(config-if)#ipv6 address 2001:db8:acad:1::1/64
R1(config-if)#no shutdown

R1(config-if)#
```

b.

```
R1#show ipv6 interface brief
GigabitEthernet0/0/0       [up/up]
    FE80::201:63FF:FE06:C001
    2001:DB8:ACAD:A::1
GigabitEthernet0/0/1       [up/up]
    FE80::201:63FF:FE06:C002
    2001:DB8:ACAD:1::1
Vlan1                      [administratively down/down]
    unassigned
```

c.

```
R1(config)#int g0/0/0
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#int g0/0/1
R1(config-if)#ipv6 address fe80::1 link-local
R1(config-if)#exit
R1(config)#end
```

d.

```
show ipv6 interface brief
GigabitEthernet0/0/0       [up/up]
    FE80::1
    2001:DB8:ACAD:A::1
GigabitEthernet0/0/1       [up/up]
    FE80::1
    2001:DB8:ACAD:1::1
Vlan1                      [administratively down/down]
    unassigned
```

Quais dois grupos multicast foram atribuídos à interface g0/0/0:

R:

```
R1#show ipv6 interface g0/0/0
GigabitEthernet0/0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::1
  No Virtual link-local address(es):
  Global unicast address(es):
    2001:DB8:ACAD:A::1, subnet is 2001:DB8:ACAD:A::/64
  Joined group address(es):
    FF02::1
    FF02::1:FF00:1
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ICMP unreachables are sent
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
R1#
```

Etapa 2 – Ative o roteamento IPV6 em R1:

a.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::2D0:58FF:FE51:5E24
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

Bluetooth Connection:

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: ::
   IPv6 Address.....: ::
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: ::
                                 0.0.0.0

C:\>
```

Um endereço IPV6 unicast foi atribuído à placa de interface de rede (NIC) do PC-B?

R: Não.

b.

```
R1>enable
R1#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#ipv6 unicast-routing
R1(config)#endd
                ^
% Invalid input detected at '^' marker.

R1(config)#end
R1#
```

c.

```
Joined group address(es):
  FF02::1
  FF02::2
  FF02::1:FF00:1
```

d.

```
C:\>ipconfig

FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::2D0:58FF:FE51:5E24
   IPv6 Address.....: 2001:DB8:ACAD:A:2D0:58FF:FE51:5E24
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: FE80::1
                         0.0.0.0
```

Por que o PC-B recebeu o prefixo de roteamento global e a ID de sub-rede que você configurou em R1?

R: Pois R1 agora é parte do grupo multicast ff02::2, assim como S1.

Etapa 3 – Atribua endereços IPV6 à interface de gerenciamento (SVI) em S1:

a.

```
S1>enable
S1#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
S1(config)#int vlan 1
S1(config-if)#ipv6 address 2001:db8:acad:1::b/64
S1(config-if)#ipv6 address fe80::b link-local
S1(config-if)#no shutdown

S1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up
exit
S1(config)#
```

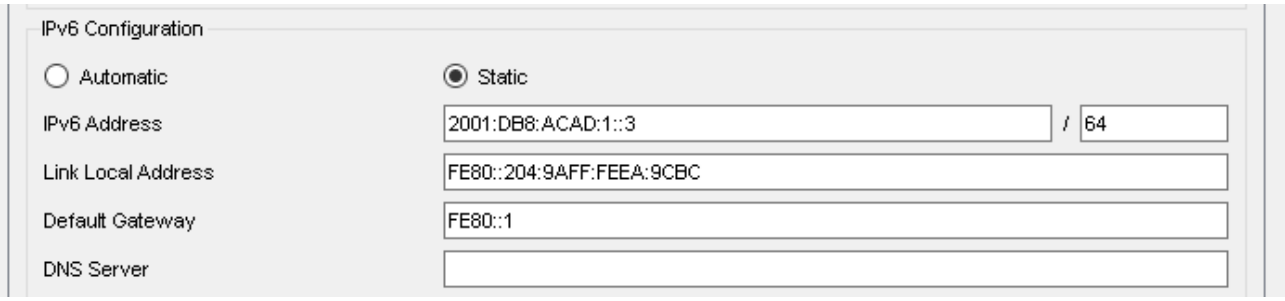
b.

```
IPv6 is enabled, link-local address is FE80::B
No Virtual link-local address(es):
Global unicast address(es):
  2001:DB8:ACAD:1::B, subnet is 2001:DB8:ACAD:1::/64
Joined group address(es):
  FF02::1
  FF02::1:FF00:B
```

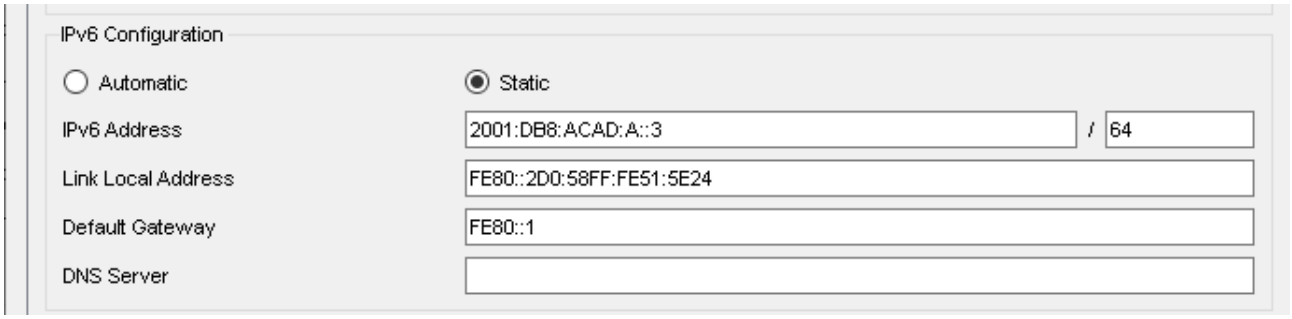
Etapa 4 – Atribua endereços IPV6 estáticos aos computadores:

a.

PC-A:



PC-B:



b.

PC-A:

```
FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::204:9AFF:FEEA:9CBC
   IPv6 Address.....: 2001:DB8:ACAD:1::3
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: FE80::1
                         0.0.0.0
```

PC-B:

```
FastEthernet0 Connection:(default port)

   Connection-specific DNS Suffix..:
   Link-local IPv6 Address.....: FE80::2D0:58FF:FE51:5E24
   IPv6 Address.....: 2001:DB8:ACAD:A::3
   IPv4 Address.....: 0.0.0.0
   Subnet Mask.....: 0.0.0.0
   Default Gateway.....: FE80::1
                                 0.0.0.0
```

PARTE 3: Verificar a conectividade de ponta a ponta

a.

```
C:\>ping fe80::1

Pinging fe80::1 with 32 bytes of data:

Reply from FE80::1: bytes=32 time=1ms TTL=255
Reply from FE80::1: bytes=32 time<1ms TTL=255
Reply from FE80::1: bytes=32 time<1ms TTL=255
Reply from FE80::1: bytes=32 time<1ms TTL=255

Ping statistics for FE80::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

b.

```
C:\>tracert 2001:db8:acad:a::3

Tracing route to 2001:db8:acad:a::3 over a maximum of 30 hops:

  1    0 ms      0 ms      12 ms     2001:DB8:ACAD:1::1
  2    0 ms      0 ms      0 ms      2001:DB8:ACAD:A::3

Trace complete.
```

c.

```
C:\>ping 2001:db8:acad:1::3

Pinging 2001:db8:acad:1::3 with 32 bytes of data:

Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127
Reply from 2001:DB8:ACAD:1::3: bytes=32 time<1ms TTL=127

Ping statistics for 2001:DB8:ACAD:1::3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

d.

```
C:\>ping fe80::1

Pinging fe80::1 with 32 bytes of data:

Reply from FE80::1: bytes=32 time<1ms TTL=255
Reply from FE80::1: bytes=32 time<1ms TTL=255
Reply from FE80::1: bytes=32 time<1ms TTL=255
Reply from FE80::1: bytes=32 time<1ms TTL=255

Ping statistics for FE80::1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PERGUNTAS PARA REFLEXÃO:

1. Por que o mesmo endereço local de link, fe80::1, pode ser atribuído às duas interfaces Ethernet no R1?

R: Cada interface do roteador pertence a uma rede separada. Os pacotes com um endereço link local nunca deixam a rede local, então você pode usar o mesmo endereço de link local nas duas interfaces.

2. Que é o ID da sub-rede do endereço unicast 2001:db8:acad::aaaa:123/64 do IPV6, se o prefixo de roteamento global é um /48?

R: Pois o prefixo global do endereço unicast é 64 → 2001:db8:acad:0000::/64 → 64 bits.