Redes de Computadores II
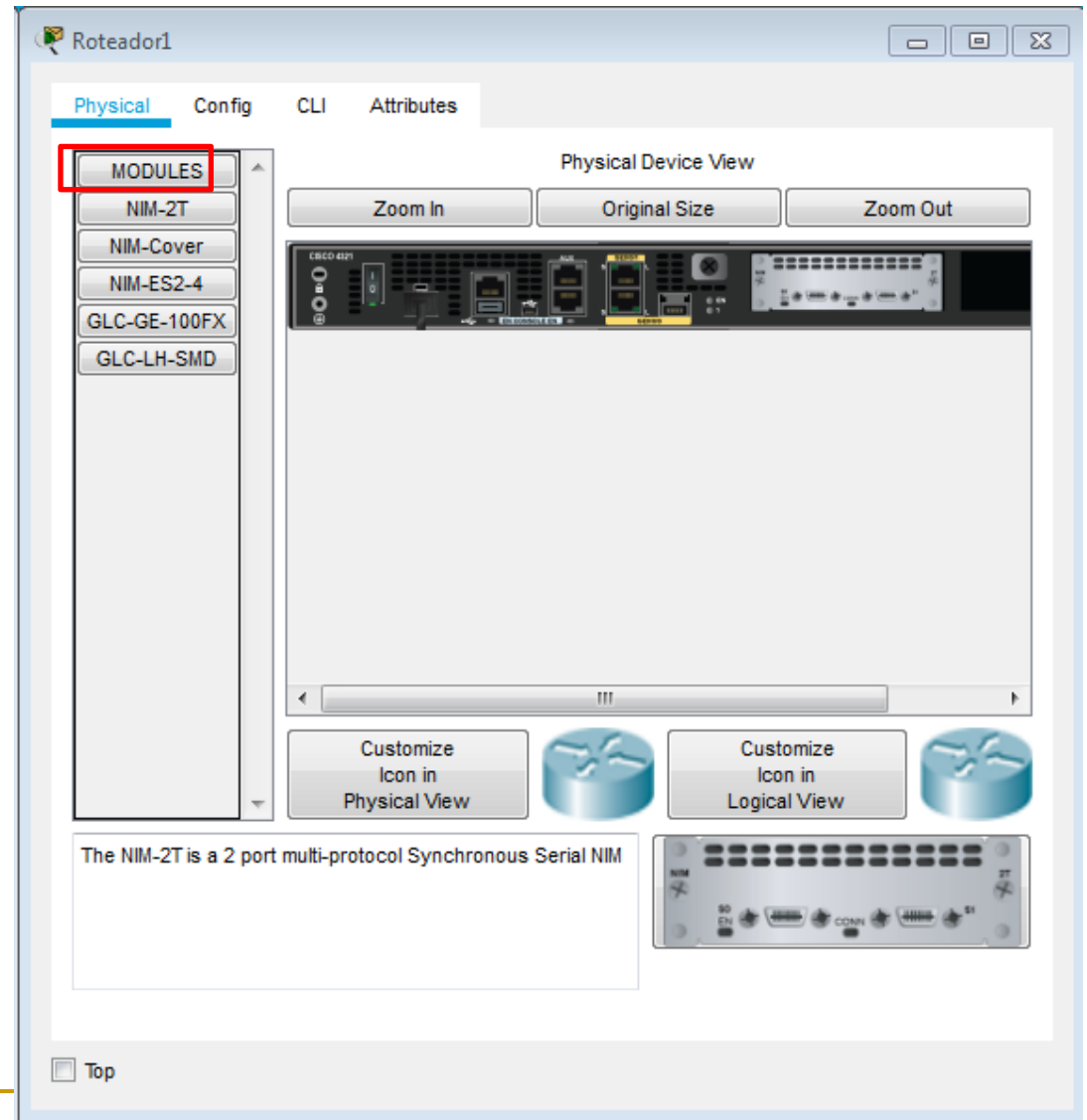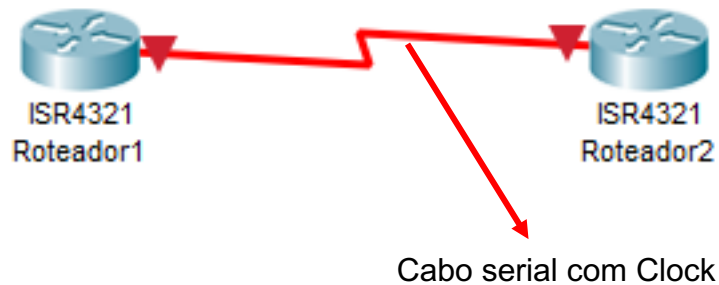
Temas: Configuração de Roteamento Estático.

Preparação para conf. de roteamento estático

Cabo serial com Clock

Preparação para conf. de roteamento estático
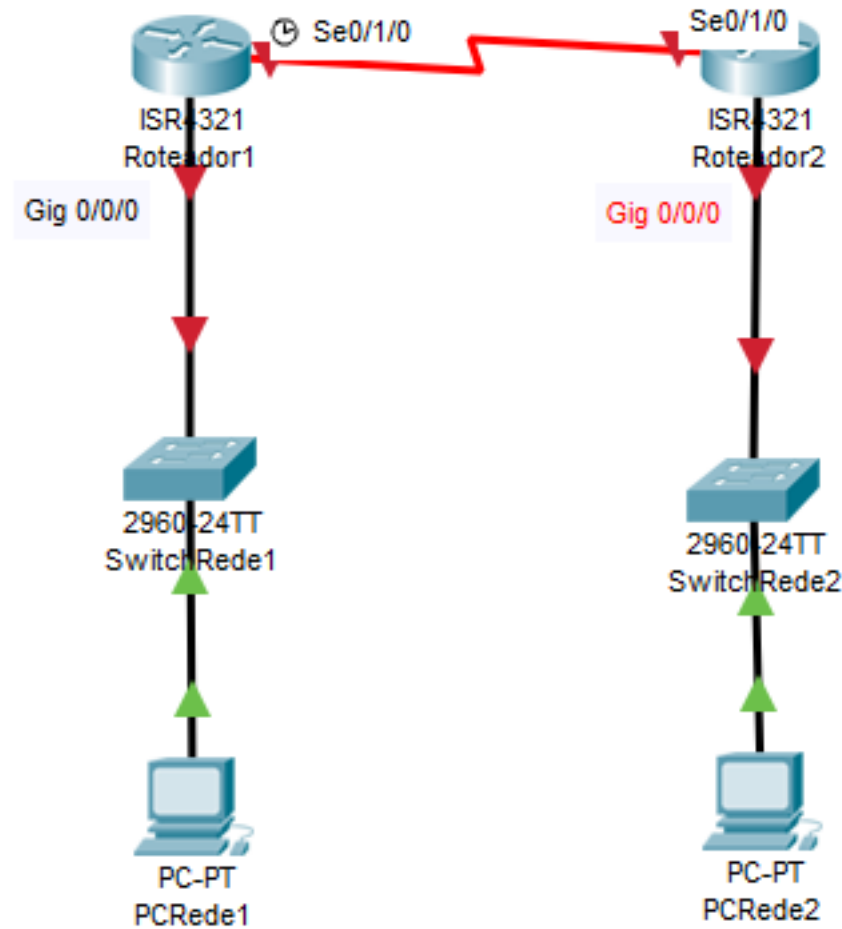
Preparação para conf. de roteamento estático

```
Roteador1>en
Roteador1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Roteador1(config)#int s0/1/0
Roteador1(config-if)#ip add
Roteador1(config-if)#ip address 192.168.100.1 255.255.255.252
Roteador1(config-if)#clock rate 64000
Roteador1(config-if)#no shut

%LINK-5-CHANGED: Interface Serial0/1/0, changed state to down
Roteador1(config-if)#do wr
Building configuration...
[OK]
Roteador1(config-if)#
```
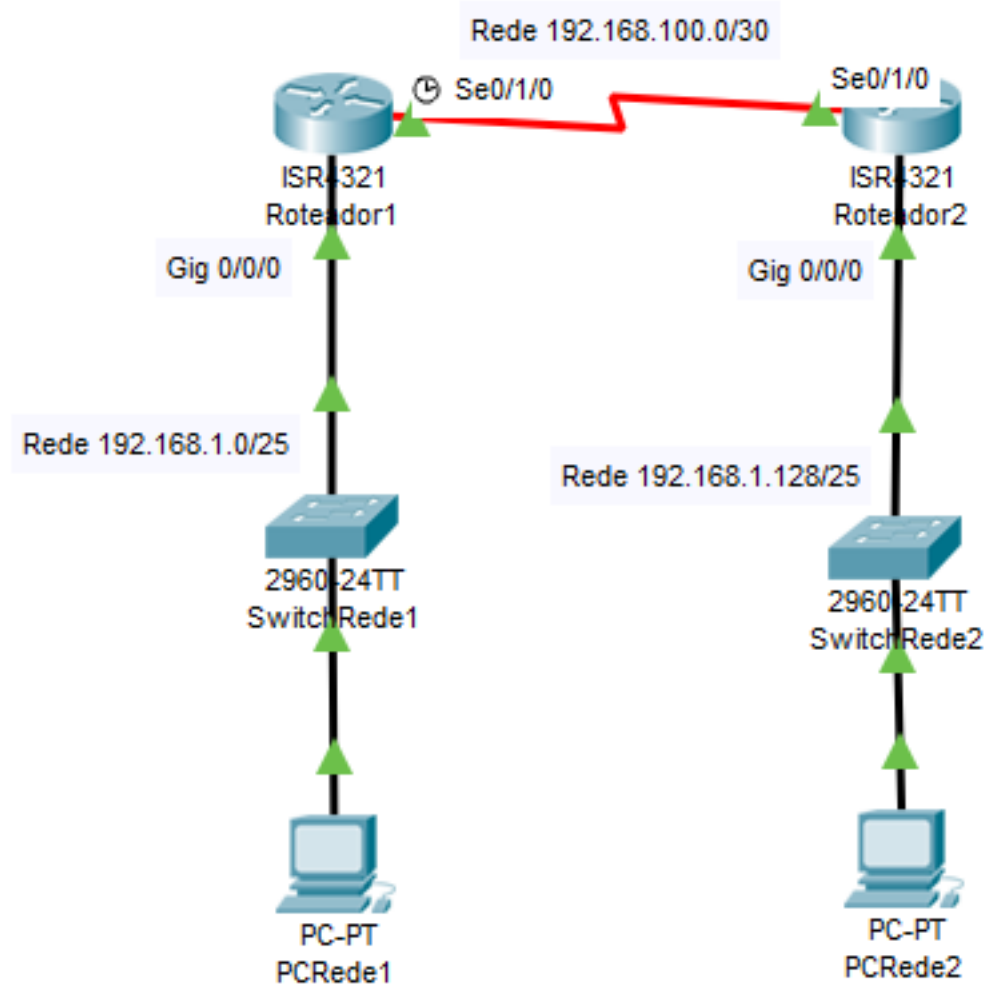
Preparação para conf. de roteamento estático

```
Roteador2>en
Roteador2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Roteador2(config)#int s0/1/0
Roteador2(config-if)#ip add
Roteador2(config-if)#ip address 192.168.100.2 255.255.255.252
Roteador2(config-if)#no shut

Roteador2(config-if)#
%LINK-5-CHANGED: Interface Serial0/1/0, changed state to up

Roteador2(config-if)#do wr
Building configuration...
[OK]
Roteador2(config-if)#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/1/0, changed
state to up
```

Preparação para conf. de roteamento estático

Preparação para conf. de roteamento estático

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit
●	Failed	PCRede1	PCRede2	ICMP		0.000	N	0	(edit)

Configuração de roteamento estático

- Consultando as rotas que cada roteador conhece antes da configuração

```
Roteador1>en
Roteador1#show ip route
Codes: L - local, 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, E - EGP
        i - IS-IS, 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

        192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C          192.168.1.0/25 is directly connected, GigabitEthernet0/0/0
L          192.168.1.126/32 is directly connected, GigabitEthernet0/0/0
        192.168.100.0/24 is variably subnetted, 2 subnets, 2 masks
C          192.168.100.0/30 is directly connected, Serial0/1/0
L          192.168.100.1/32 is directly connected, Serial0/1/0
```

Configuração de roteamento estático

- Consultando as rotas que cada roteador conhece antes da configuração

```
Roteador2>en
Roteador2#show ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

       192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C         192.168.1.128/25 is directly connected, GigabitEthernet0/0/0
L         192.168.1.254/32 is directly connected, GigabitEthernet0/0/0
       192.168.100.0/24 is variably subnetted, 2 subnets, 2 masks
C         192.168.100.0/30 is directly connected, Serial0/1/0
L         192.168.100.2/32 is directly connected, Serial0/1/0
```

Configuração de roteamento estático

- Realizando a configuração no Roteador1

```
Roteador1(config)#ip route ?
  A.B.C.D  Destination prefix
Roteador1(config)#ip route 192.168.1.128 ?
  A.B.C.D  Destination prefix mask
Roteador1(config)#ip route 192.168.1.128 255.255.255.128 ?
  A.B.C.D            Forwarding router's address
  Dialer             Dialer interface
  Ethernet           IEEE 802.3
  FastEthernet       FastEthernet IEEE 802.3
  GigabitEthernet    GigabitEthernet IEEE 802.3z
  Loopback           Loopback interface
  Null               Null interface
  Serial             Serial
  Vlan               Catalyst Vlans
Roteador1(config)#ip route 192.168.1.128 255.255.255.128 192.168.100.2
```

Configuração de roteamento estático

- Realizando a configuração no Roteador2

```
Roteador2(config)#ip route 192.168.1.0 255.255.255.128 192.168.100.1
Roteador2(config)#do sh ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

     192.168.1.0/24 is variably subnetted, 3 subnets, 2 masks
S       192.168.1.0/25 [1/0] via 192.168.100.1
C       192.168.1.128/25 is directly connected, GigabitEthernet0/0/0
L       192.168.1.254/32 is directly connected, GigabitEthernet0/0/0
     192.168.100.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.100.0/30 is directly connected, Serial0/1/0
L       192.168.100.2/32 is directly connected, Serial0/1/0
```

Configuração de roteamento estático

■ Consultando as rotas que cada roteador conhece após a configuração

```
Roteador1(config)#do sh ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

      192.168.1.0/24 is variably subnetted, 3 subnets, 2 masks
C        192.168.1.0/25 is directly connected, GigabitEthernet0/0/0
L        192.168.1.126/32 is directly connected, GigabitEthernet0/0/0
S        192.168.1.128/25 [1/0] via 192.168.100.2
      192.168.100.0/24 is variably subnetted, 2 subnets, 2 masks
C        192.168.100.0/30 is directly connected, Serial0/1/0
L        192.168.100.1/32 is directly connected, Serial0/1/0
.
```

Configuração de roteamento estático

- Testando a comunicação entre os PCs

t Fire		Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Dele
	●	Successful	PCRe...	PCRede2	ICMP		0.000	N	0	(edit)	(dele
	●	Successful	PCRe...	PCRede1	ICMP		0.000	N	1	(edit)	(dele

Configuração de roteamento estático

- Outro cenário:

Configuração de roteamento estático

- Consultando as rotas que cada roteador conhece antes da configuração

```
Roteador1(config)#do sh ip route
Codes: L - local, 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, E - EGP
        i - IS-IS, 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

        22.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       22.0.0.0/26 is directly connected, Serial0/1/0
L       22.0.0.1/32 is directly connected, Serial0/1/0
C       22.0.0.64/26 is directly connected, Serial0/1/1
L       22.0.0.65/32 is directly connected, Serial0/1/1
```
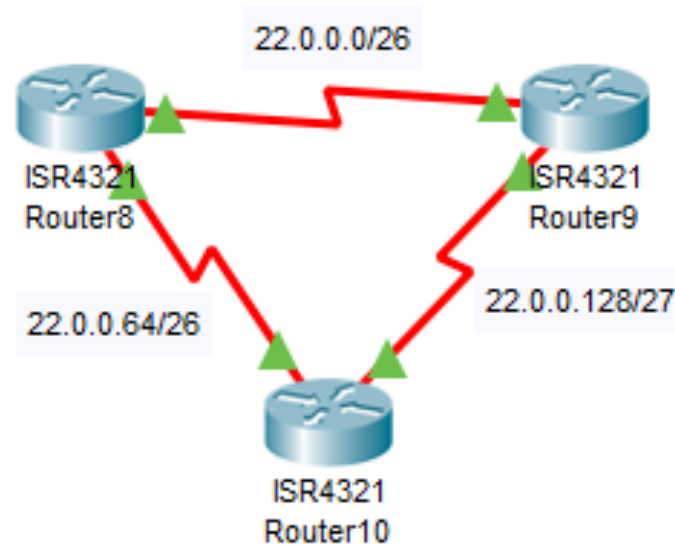
Configuração de roteamento estático

- Consultando as rotas que cada roteador conhece antes da configuração

```
Roteador2(config)#do sh ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

       22.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C        22.0.0.0/26 is directly connected, Serial0/1/0
L        22.0.0.2/32 is directly connected, Serial0/1/0
C        22.0.0.128/27 is directly connected, Serial0/1/1
L        22.0.0.130/32 is directly connected, Serial0/1/1
```

Configuração de roteamento estático

■ Consultando as rotas que cada roteador conhece antes da configuração

```
Roteador3(config)#do sh ip route
Codes: L - local, 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, E - EGP
        i - IS-IS, 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

        22.0.0.0/8 is variably subnetted, 4 subnets, 3 masks
C       22.0.0.64/26 is directly connected, Serial0/1/1
L       22.0.0.66/32 is directly connected, Serial0/1/1
C       22.0.0.128/27 is directly connected, Serial0/1/0
L       22.0.0.129/32 is directly connected, Serial0/1/0
```

Configuração de roteamento estático

- Realizando a configuração no Roteador1

```
Roteador1(config)#ip route ?
  A.B.C.D  Destination prefix
Roteador1(config)#ip route 22.0.0.128 ?
  A.B.C.D  Destination prefix mask
Roteador1(config)#ip route 22.0.0.128 255.255.255.224 ?
  A.B.C.D          Forwarding router's address
  Dialer           Dialer interface
  Ethernet         IEEE 802.3
  FastEthernet     FastEthernet IEEE 802.3
  GigabitEthernet  GigabitEthernet IEEE 802.3z
  Loopback         Loopback interface
  Null             Null interface
  Serial           Serial
  Vlan             Catalyst Vlans
Roteador1(config)#ip route 22.0.0.128 255.255.255.224 22.0.0.2
```

Configuração de roteamento estático

- Consultando as rotas que cada roteador conhece após a configuração

```
Roteador1(config)#do sh ip route
Codes: L - local, 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, E - EGP
        i - IS-IS, 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

        22.0.0.0/8 is variably subnetted, 5 subnets, 3 masks
C        22.0.0.0/26 is directly connected, Serial0/1/0
L        22.0.0.1/32 is directly connected, Serial0/1/0
C        22.0.0.64/26 is directly connected, Serial0/1/1
L        22.0.0.65/32 is directly connected, Serial0/1/1
S        22.0.0.128/27 [1/0] via 22.0.0.2
```

Configuração de roteamento estático

- Realizando a configuração no Roteador2

```
Roteador2(config)#ip route 22.0.0.64 255.255.255.192 22.0.0.1
Roteador2(config)#do sh ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

       22.0.0.0/8 is variably subnetted, 5 subnets, 3 masks
C        22.0.0.0/26 is directly connected, Serial0/1/0
L        22.0.0.2/32 is directly connected, Serial0/1/0
S        22.0.0.64/26 [1/0] via 22.0.0.1
C        22.0.0.128/27 is directly connected, Serial0/1/1
L        22.0.0.130/32 is directly connected, Serial0/1/1
```

Configuração de roteamento estático

- Realizando a configuração no Roteador3

```
Roteador3(config)#ip route 22.0.0.0 255.255.255.192 22.0.0.65
Roteador3(config)#do sh ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, 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

     22.0.0.0/8 is variably subnetted, 5 subnets, 3 masks
S        22.0.0.0/26 [1/0] via 22.0.0.65
C        22.0.0.64/26 is directly connected, Serial0/1/1
L        22.0.0.66/32 is directly connected, Serial0/1/1
C        22.0.0.128/27 is directly connected, Serial0/1/0
L        22.0.0.129/32 is directly connected, Serial0/1/0
```

Exercícios propostos:

1. Tente construir, configurar com roteamento estático e testar o ping do seguinte cenário.
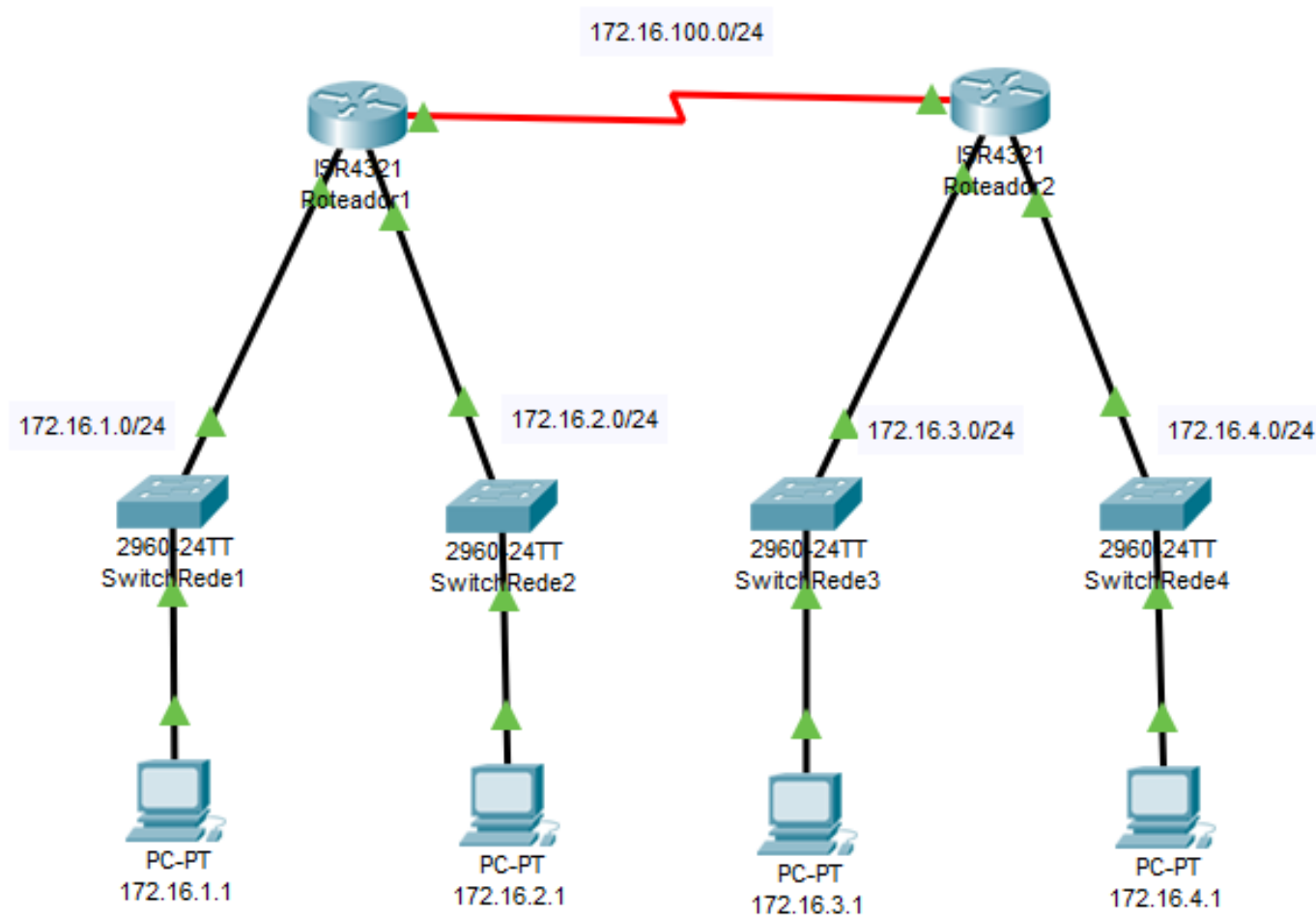
Bibliografia

- **BÁSICA:**
- BRITO, S. H. B. **IPv6**: o novo protocolo da internet. São Paulo: Novatec, 2013.
- COMER, D. **Interligação de redes com TCP/IP**: princípios, protocolos e arquitetura. Rio de Janeiro: Elsevier; Campus, 2006. v.1.
- SOUSA, L. B. **Projetos e implementação de redes**: Fundamentos,soluções, arquiteturas e planejamento. 2. ed. São Paulo: Érica, 2011.

- **COMPLEMENTAR:**
- BIRKNER, MATTHEW H. (ED.). **Projeto de interconexão de redes**: CISCO Internetwork Design - CID. São Paulo: Pearson Education, 2003.
- BRITO, S. H. B. **Laboratórios de tecnologias cisco em infraestrutura de redes**. 2.ed. São paulo: Novatec, 2014.
- FREITAS, A. E. S.; BEZERRA, R. M. S. **IPv6**: conceitos e aspectos práticos. Rio Janeiro: Ciência Moderna, 2015.
- LIMA, João Paulo de. **Administração de redes Linux**: passo a passo. Goiânia: Terra, 2003.
- STARLIN, G. **Redes de computadores**: comunicação de dados TCP/IP: conceitos, protocolos e uso. Rio de Janeiro: Alta Books, 2004.
- VASCONCELOS, L.; VASCONCELOS, M. **Manual prático de redes**. Rio de Janeiro: Laércio Vasconcelos Computação, 2008.