Monitoramento e Gerenciamento de Redes

- Switching VLANs e Access-List -

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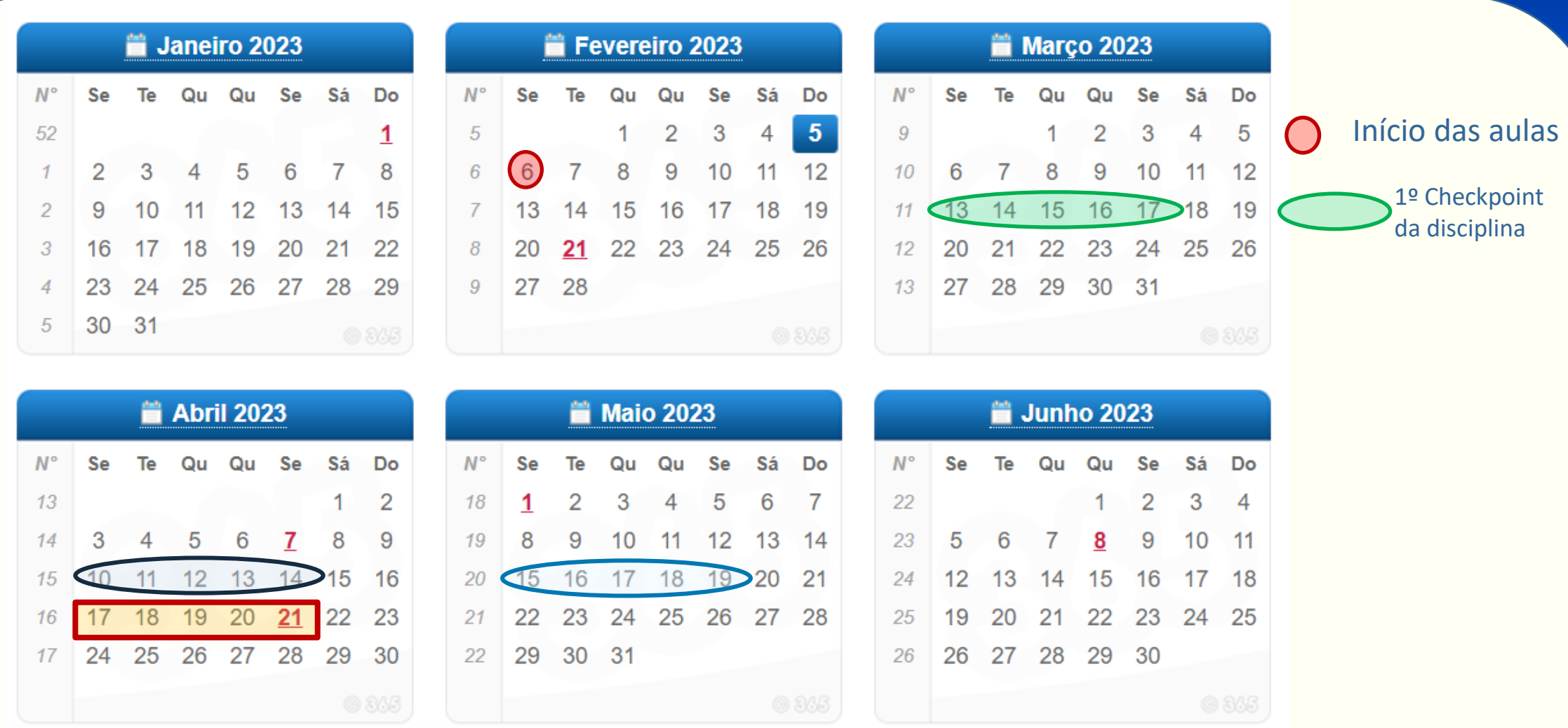
Plano de Aula

- **Objetivo**
  - Feedback do 1º Checkpoint e do 2º Checkpoint
  - Praticar o conceito de VLAN com Access-list
- **Conteúdo**
  - Switch
  - Virtual Local Area Network - VLAN
  - *Switch Trunking*
  - Subinterfaces dot1q
  - Access-control Lists
- **Metodologia**
  - Aula prática sobre os conceitos de Switch, VLAN e Trunking, com desenvolvimento de atividade prática e configuração em simulador (*Packet Tracer*).

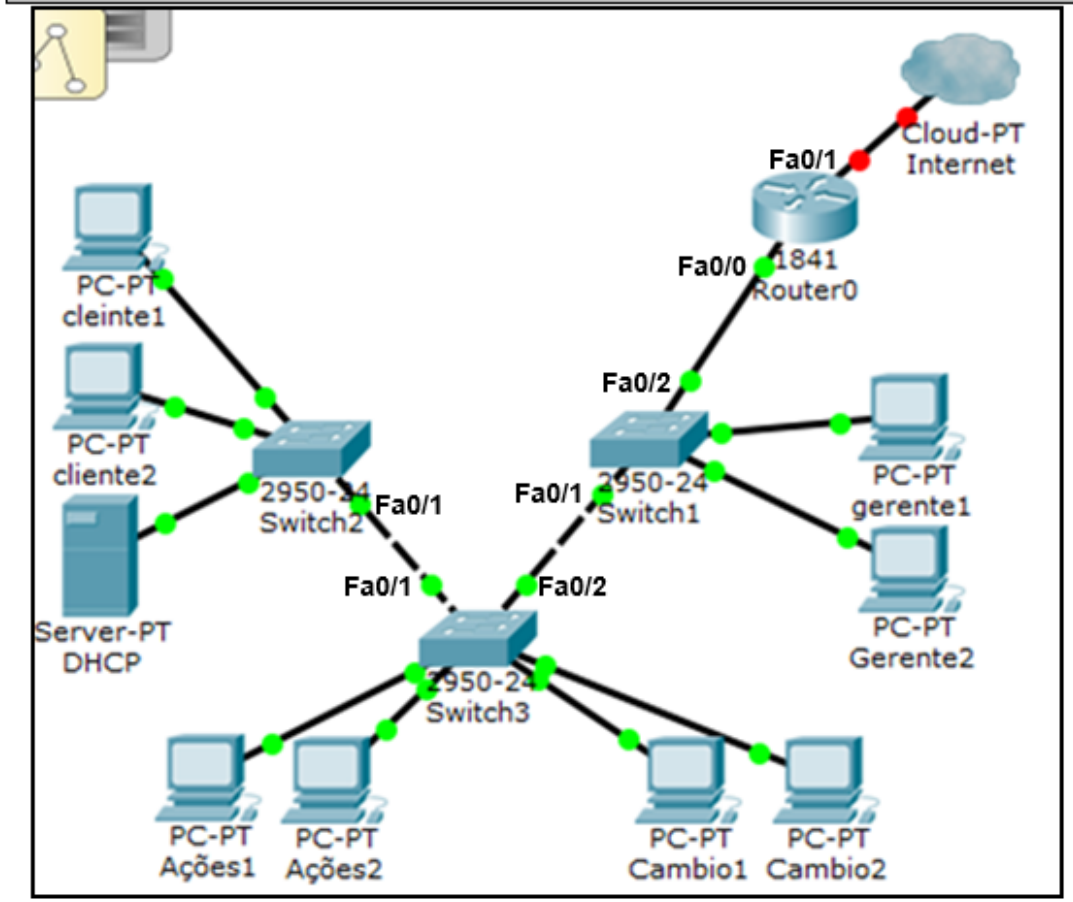
Agenda do Primeiro semestre - 2023



- 1º Checkpoint – Gabarito

Cenário Apresentado

Para a resolução desta Avaliação Checkpoint considere a topologia e as informações a seguir:



a) A topologia representa a rede de comunicação de uma instituição bancária denominada BANK1 com 4 setores:

1) **Gerentes:** Setor de Gerentes Comerciais;
2) **Câmbio:** Setor de Câmbio e remessas internacionais;
3) **Clientes:** Setor Caixas de atendimento ao público;
4) **Ações:** Setor de investimento em ações.

b) Todos os *hosts* estão configurados para obter endereçamento IP via **DHCP**;

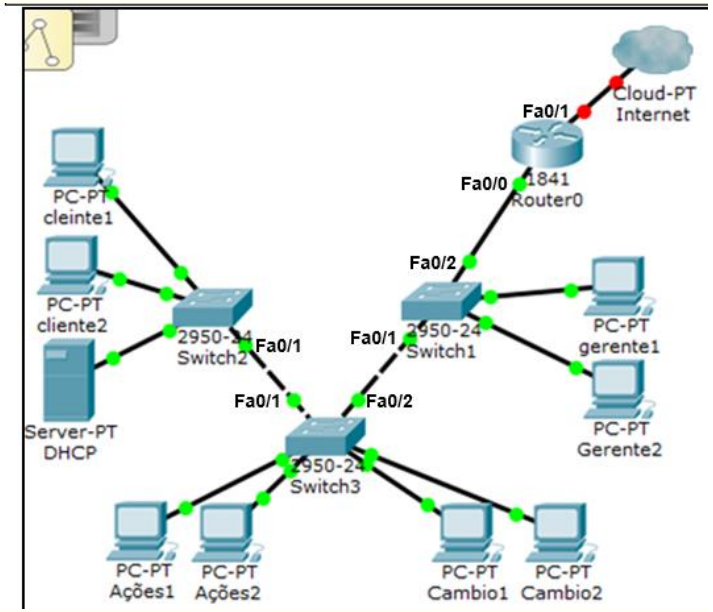
c) Os equipamentos listados a seguir receberam via DHCP os endereços IP indicados:

gerente1: IP 202.202.202.2, gateway 202.202.202.1
gerente2: IP 202.202.202.3, gateway 202.202.202.1
cliente2: IP 200.200.200.3, gateway 200.200.200.1
Ações1: IP 200.200.200.10, gateway 200.200.200.1

d) a instituição bancária BANK1 possui as seguintes redes classes C disponíveis para configuração de sua topologia:

200.200.200.0/24 201.201.201.0/24
202.202.202.0/24 203.203.203.0/24

Cenário Apresentado



=====Roteador=====

```
Router>enable
Router#configure terminal
Router(config)#interface fa0/0
Router(config-if)#ip address 200.200.200.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
Router(config)#interface fa0/0.2
Router(config-if)#encapsulation dot1q  2
Router(config-if)#ip address 202.202.202.1 255.255.255.0
Router(config-if)#
Router#
Router#configure terminal
Router(config)#ip dchp pool gerentes
Router(dhcp-config)#default-router   202.202.202.1
Router(dhcp-config)#net 202.202.202.0   255.255.255.0
Router#
```

=====Switch 2=====

```
Switch>
Switch>enable
Switch#configure terminal
Switch(config)#
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
```

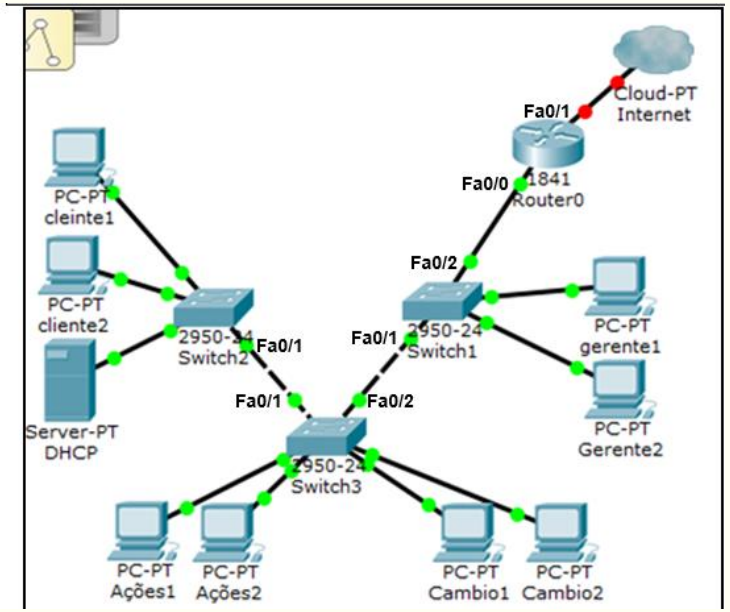
====Switch 1======

```
Switch>
Switch>enable
Switch#configure terminal
Switch(config)#vlan 2
Switch(config-vlan)#name gerentes
Switch(config-vlan)#interface range fa0/3-24
Switch(config-if-range)#switchport access vlan 2
Switch(config-if-range)#end
Switch(config)#
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
Switch(config-if)#interface fa0/2
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
```

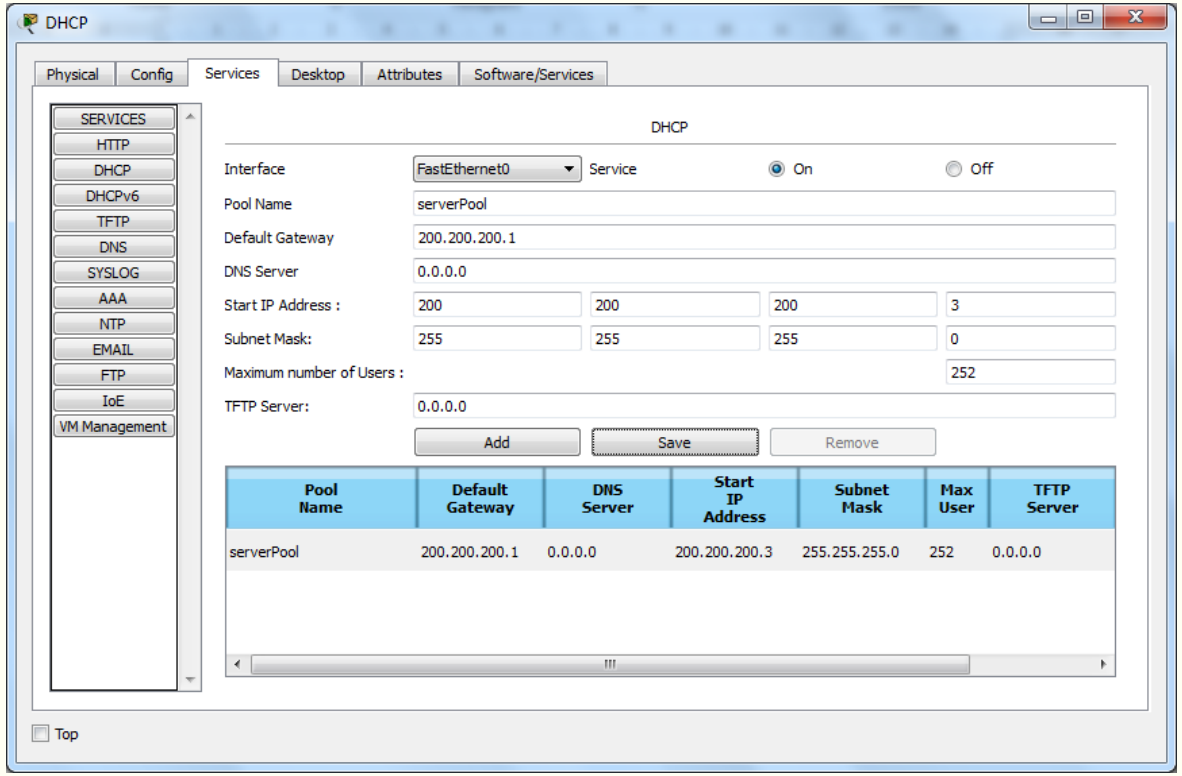
====Switch 3======

```
Switch>
Switch>
Switch>enable
Switch#configure terminal
Switch(config)#
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
Switch#
Switch(config-if)#interface fa0/2
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
```

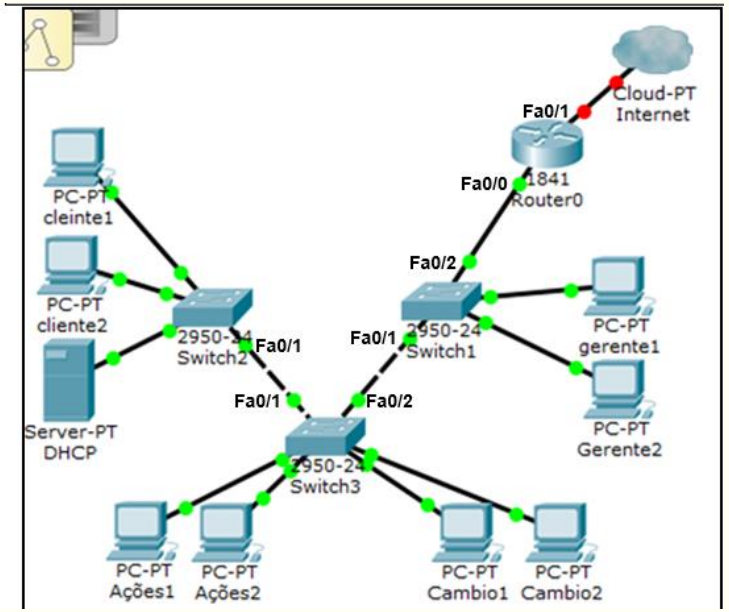
Cenário Apresentado



O servidor DHCP conectado ao switch2 foi configurado com os parâmetros apresentados na imagem :



Questões



Questão 01: (3 pontos)

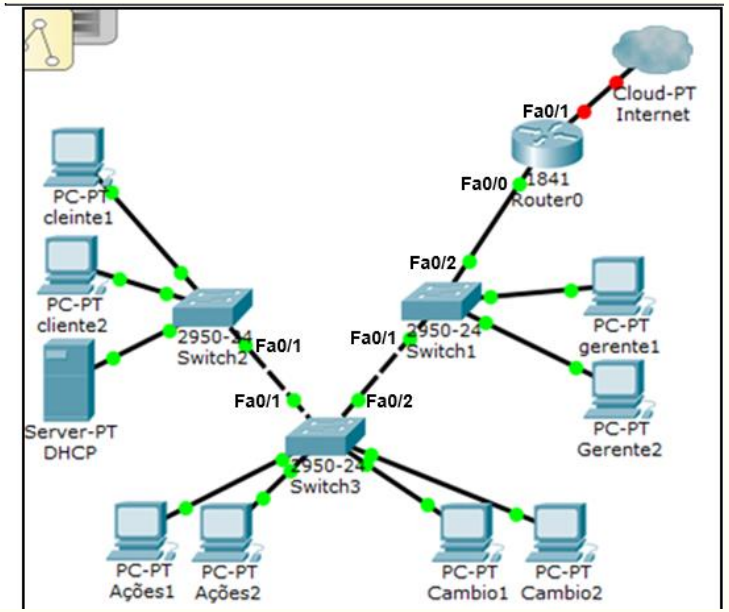
Considerando a configuração inicialmente realizada e apresentada na primeira página, responda:

a) Quantos *'domínios de broadcast (camada2)"* existem na de LAN da instituição bancária BANK1?

b)Quais equipamentos poderão receber endereços IPs do **servidor DHCP** que está conectado ao **switch2**?

c) Quais equipamentos irão receber os *broadcasts* gerados pelo host **cliente2** no momento de uma requisição DHCP?

Questões



Questão 01: (3 pontos)

Considerando a configuração inicialmente realizada e apresentada na primeira página, responda:

a) Quantos *'domínios de broadcast (camada2)"* existem na de LAN da instituição bancária BANK1?

R=**Dois domínios de *broadcast***, sendo um na VLAN 2 gerentes (hosts gerente1 e gerente 2) e outra na Vlan 1 default (todos os demais equipamentos)

b)Quais equipamentos poderão receber endereços IPs do **servidor DHCP** que está conectado ao **switch2**?

R= Todos os equipamentos da VLAN 1 Default (ou seja, todos os equipamentos exceto os hosts gerente1 e gerente2 que estão na VLAN2 gerentes.

c) Quais equipamentos irão receber os *broadcasts* gerados pelo host **cliente2** no momento de uma requisição DHCP?

R= Todos os equipamentos da VLAN 1 Default (ou seja, todos os equipamentos exceto os hosts gerente1 e gerente2 que estão na VLAN2 gerentes.

Questões

Questão 2: (7,0 pontos)

Apresente as configurações necessárias nos **switches** e no **roteador** para que cada setor da BANK1 esteja em uma VLAN independente e recebendo endereçamento IP via DHCP.

a) Switch1:

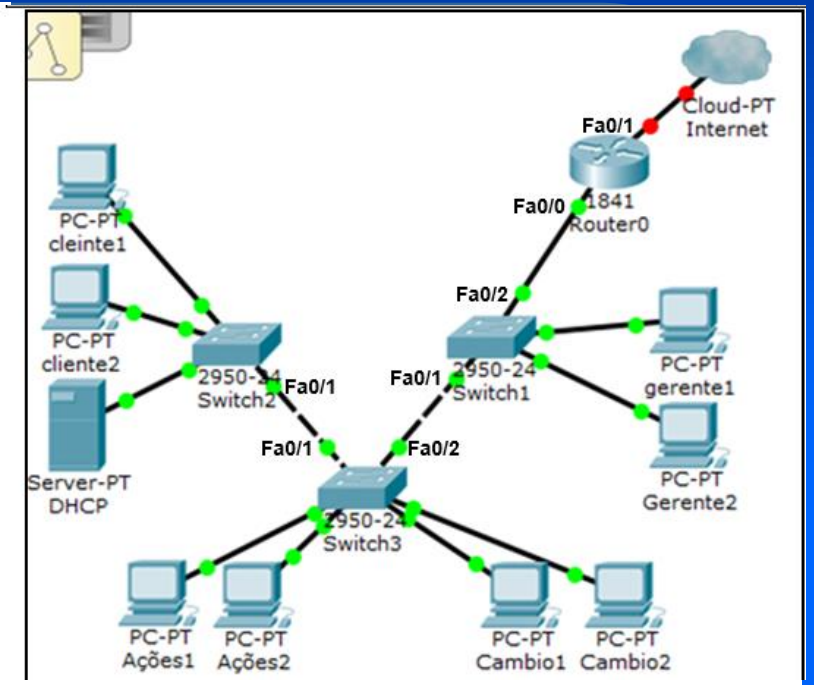
Não é necessária nenhuma configuração neste switch, visto que a VLAN e a porta trunk já foram configuradas.

b) Switch2:

```
Switch>
Switch>enable
Switch#configure terminal
Switch(config)#vlan 3
Switch(config-vlan)#name clientes
Switch(config-vlan)#interface range fa0/2-24
Switch(config-if-range)#switchport access vlan 3
Switch(config-if-range)#end
Switch(config)#
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
```

c) Switch3:

```
Switch>
Switch>enable
Switch#configure terminal
Switch(config)#vlan 4
Switch(config-vlan)#name acoes
Switch(config-vlan)#interface range fa0/3-10
Switch(config-if-range)#switchport access vlan 4
Switch(config-if-range)#end
Switch(config)#vlan 5
Switch(config-vlan)#name cambio
Switch(config-vlan)#interface range fa0/10-24
Switch(config-if-range)#switchport access vlan 5
Switch(config-if-range)#
Switch(config)#
Switch(config)#interface fa0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
Switch(config)#interface fa0/2
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
Switch(config-if)#
```



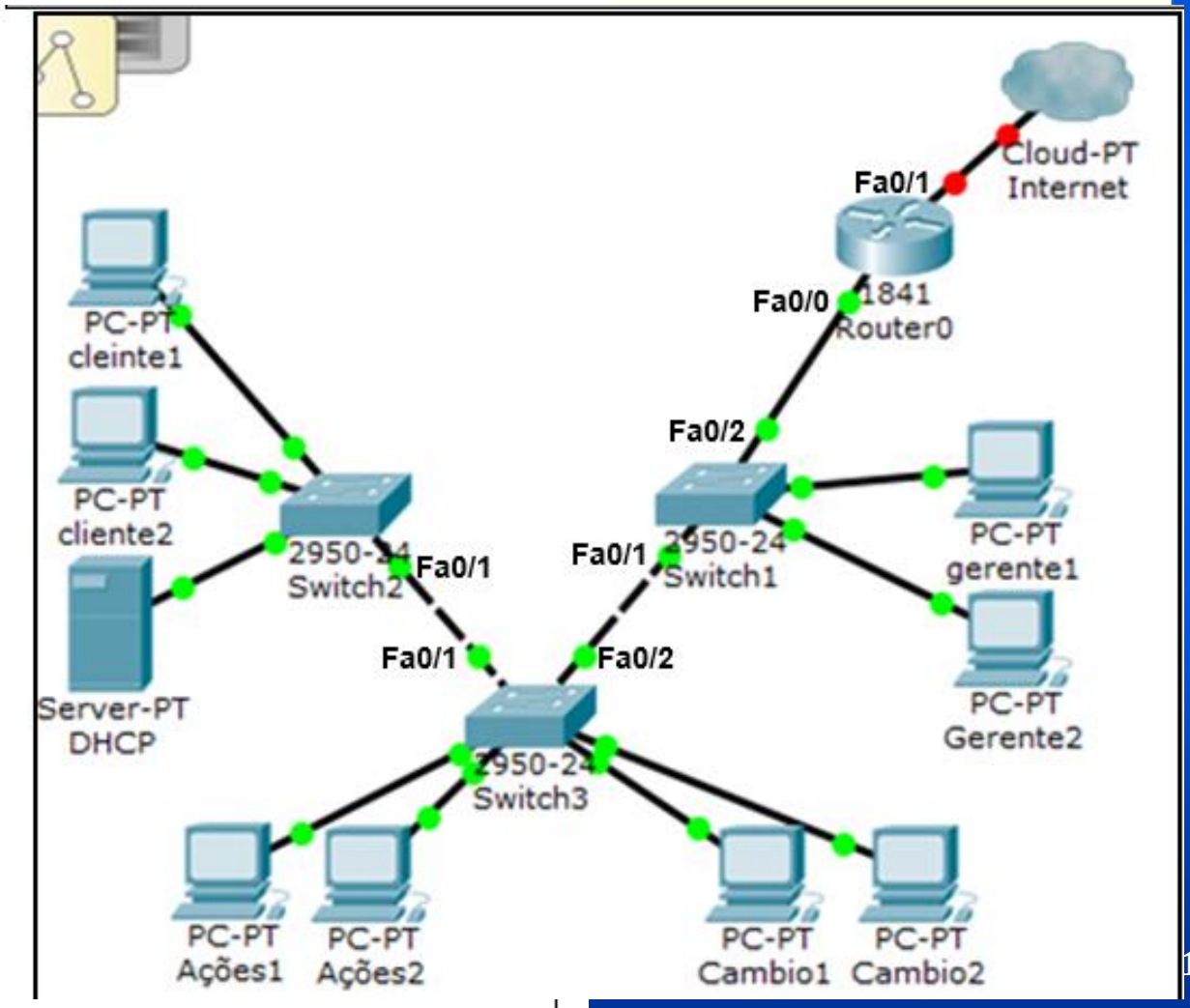
Questões

Questão 2: (7,0 pontos)

Apresente as configurações necessárias nos **switches** e no **roteador** para que cada setor da BANK1 esteja em uma VLAN independente e recebendo endereçamento IP via DHCP.

d) Roteador:

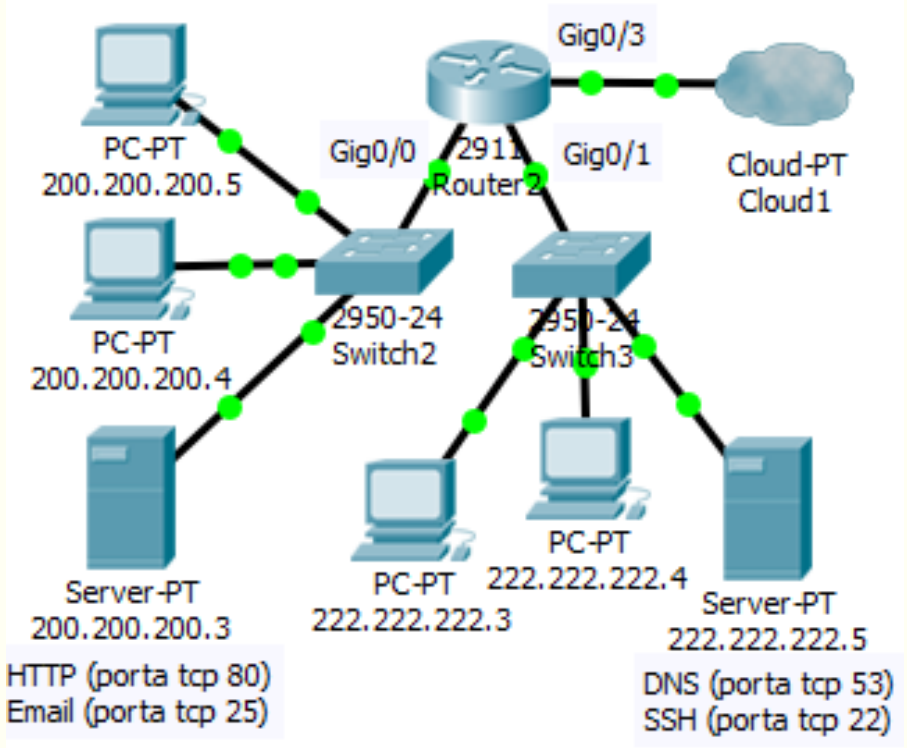
```
Router>enable
Router#configure terminal
Router(config)#interface fa0/0
Router(config-if)#no ip address 200.200.200.1 255.255.255.0
Router(config-if)#
Router(config)#interface fa0/0.3
Router(config-if)#encapsulation dot1q  3
Router(config-if)#ip address 200.200.200.1 255.255.255.0
Router(config-if)#
Router(config)#interface fa0/0.4
Router(config-if)#encapsulation dot1q  4
Router(config-if)#ip address 201.201.201.1 255.255.255.0
Router(config-if)#end
Router(config)#
Router(config)#
Router(config)#ip dchp pool acoes
Router(dhcp-config)#default-router   201.201.201.1
Router(dhcp-config)#net 201.201.201.0   255.255.255.0
Router(dhcp-config)#end
Router(config)#
Router(config)#interface fa0/0.5
Router(config-if)#encapsulation dot1q  5
Router(config-if)#ip address 203.203.203.1   255.255.255.0
Router(config-if)#end
Router(config)#
Router(config)#ip dchp pool cambio
Router(dhcp-config)#default-router   203.203.203.1
Router(dhcp-config)#net 203.203.203.0   255.255.255.0
Router(dhcp-config)#
```



- 2º Checkpoint –

Gabarito da **Prova 1**

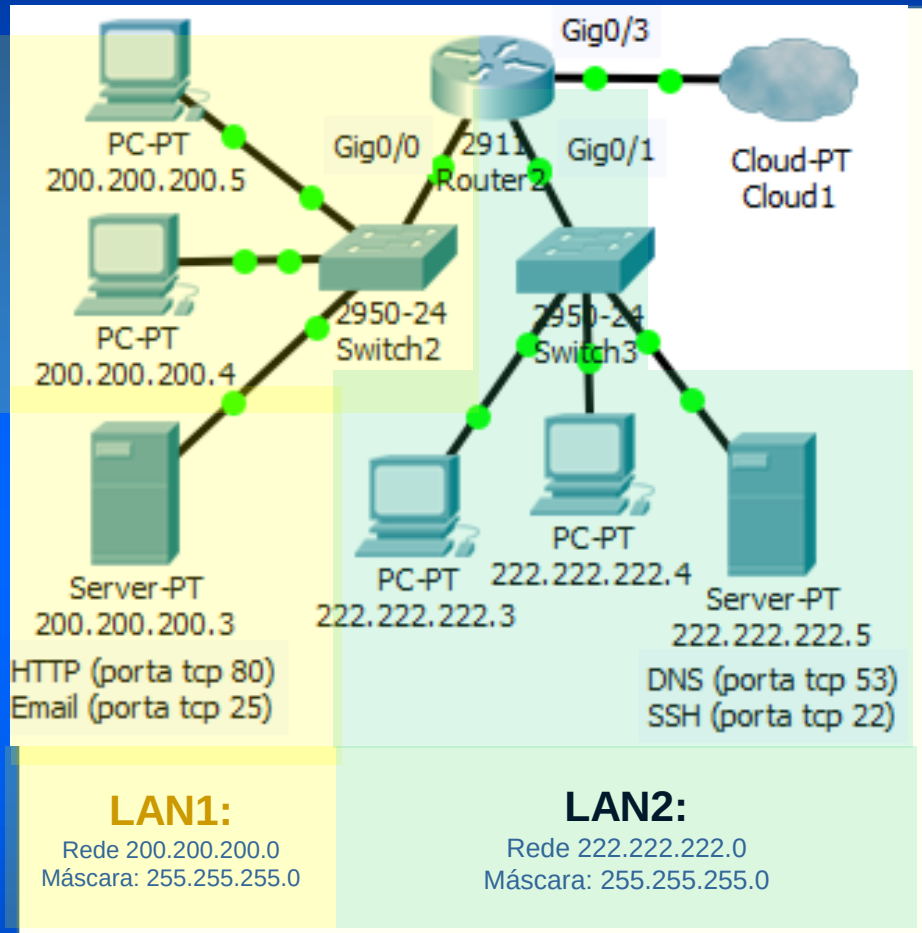
Analise o cenário a seguir (2º Checkpoint): Prova 1



Arquivo na área de apostilas do Portal da FIAP:

`Aula 10 2023 Checkpoint VLANs Firewall.pkt`

Analise o cenário a seguir (2º Checkpoint): Prova 1



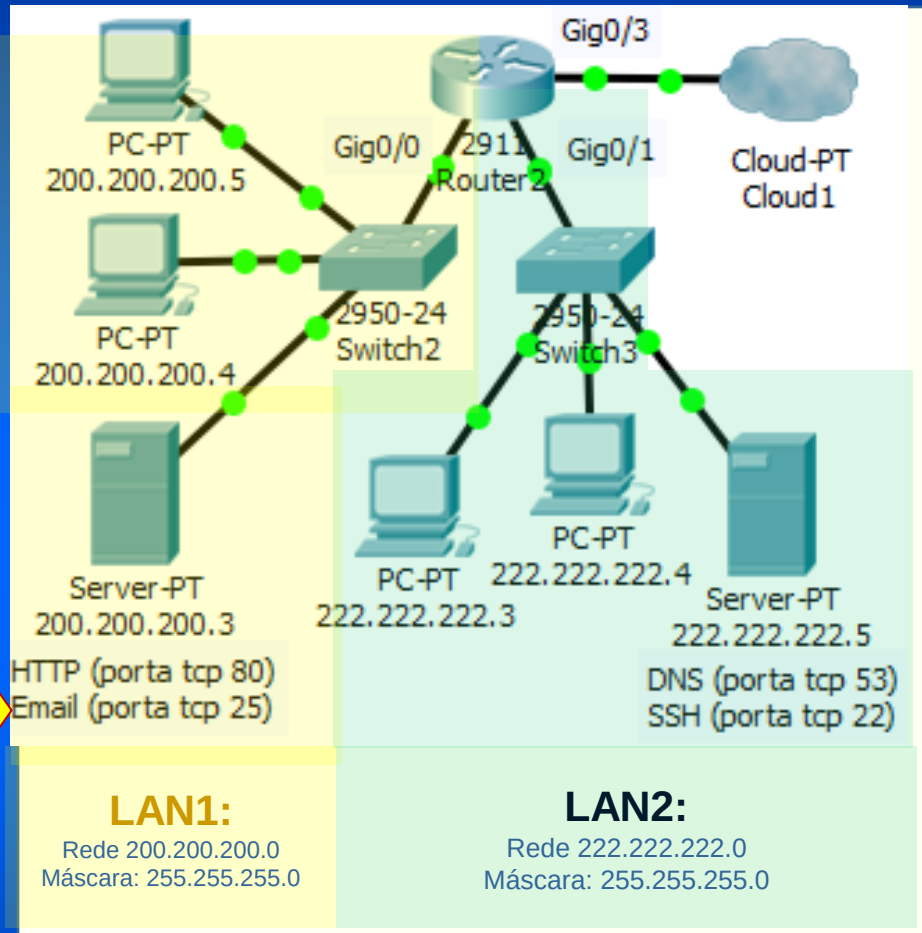
Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5

router(config)#interface gig0/3
router(config-if)#ip access-group 100 in

router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Analise o cenário a seguir (2º Checkpoint): Prova 1



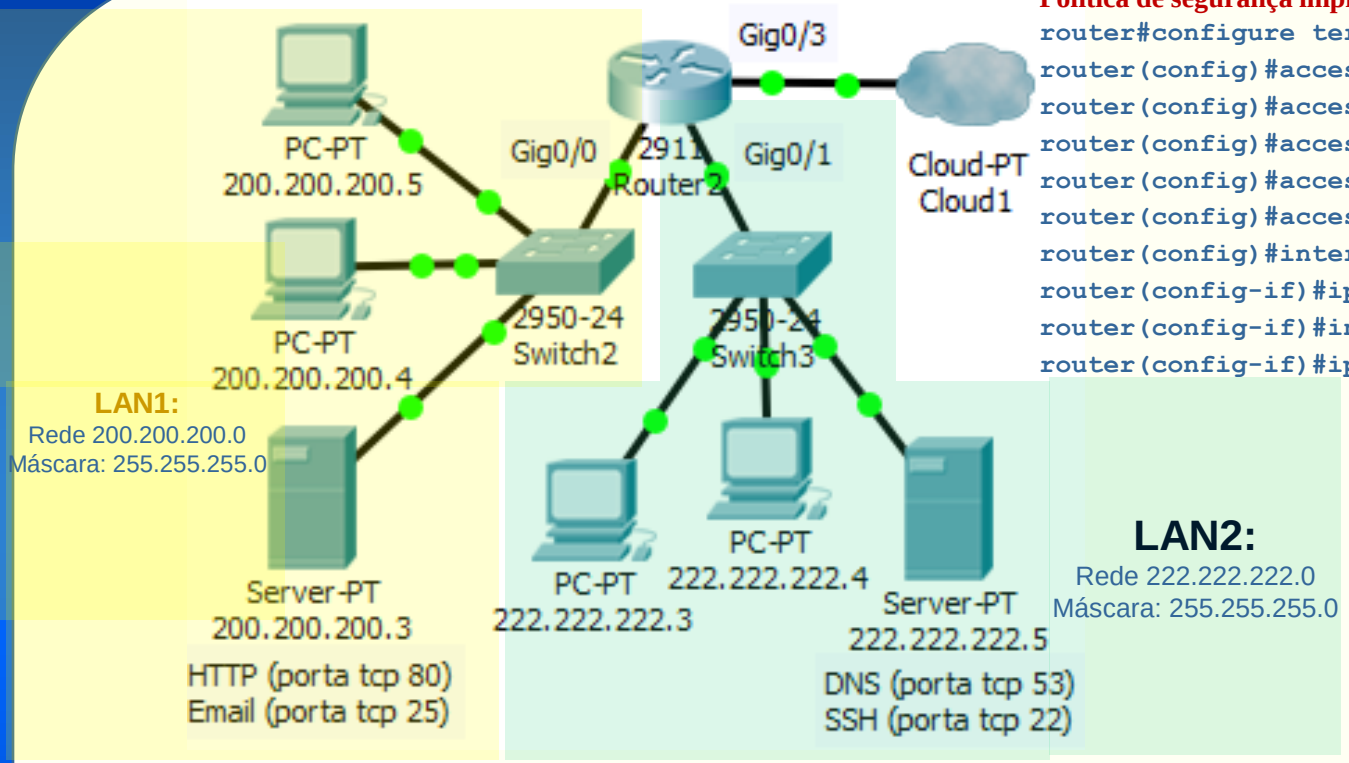
Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5

router(config)#interface gig0/3
router(config-if)#ip access-group 100 in

router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Analise o cenário a seguir (2º Checkpoint): Prova 1



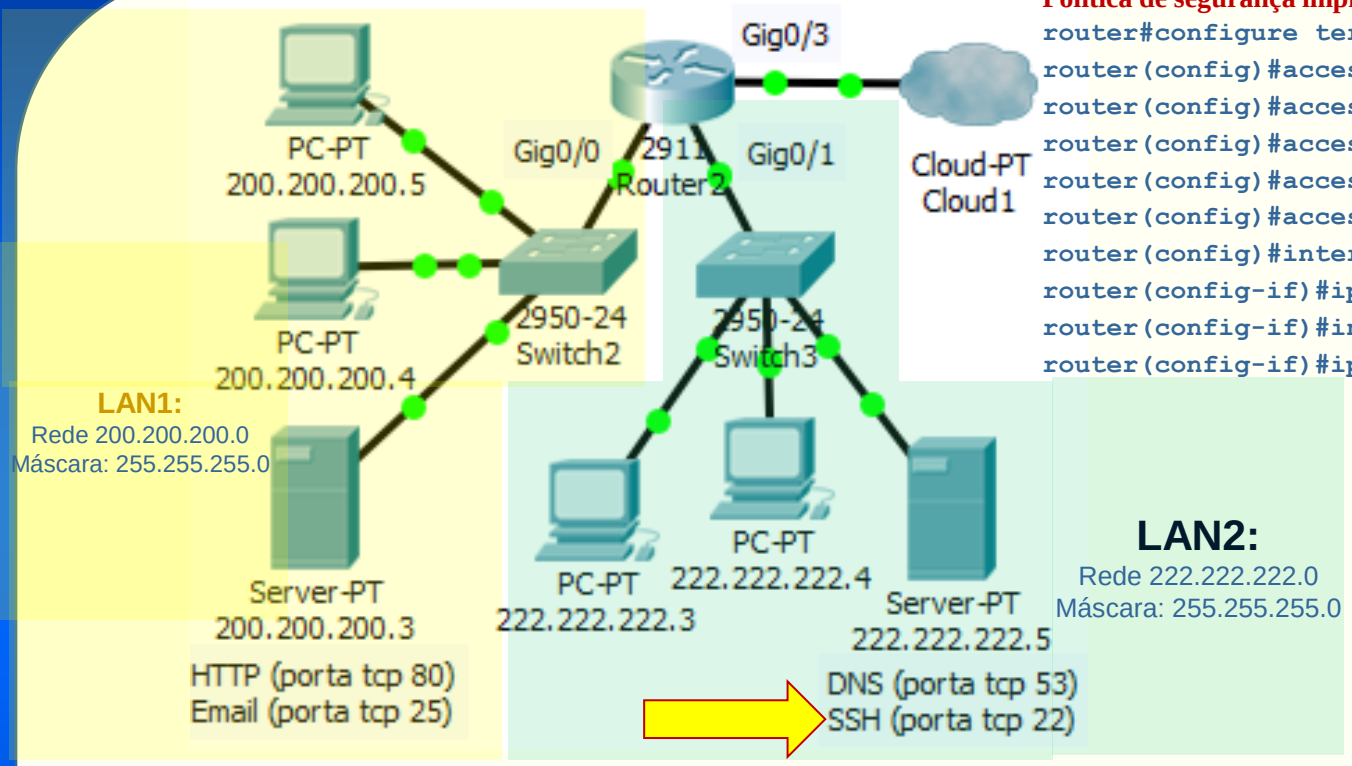
Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5
router(config)#interface gig0/3
router(config-if)#ip access-group 100 in
router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Questão 1: Quais hosts poderão acessar o serviço de E-MAIL no servidor 200.200.200.3

1. O host 120.120.120.5, localizado na Internet.
2. Quaisquer outros endereços na internet (any) com destino a 200.200.200.3, na porta 25, serão bloqueados.
3. Todos os hosts da rede interna, pois não há regras no roteador para este caso: acessar o serviço de E-MAIL (QUE UTILIZA PORTA TCP 25) .

Analise o cenário a seguir (2º Checkpoint): Prova 1



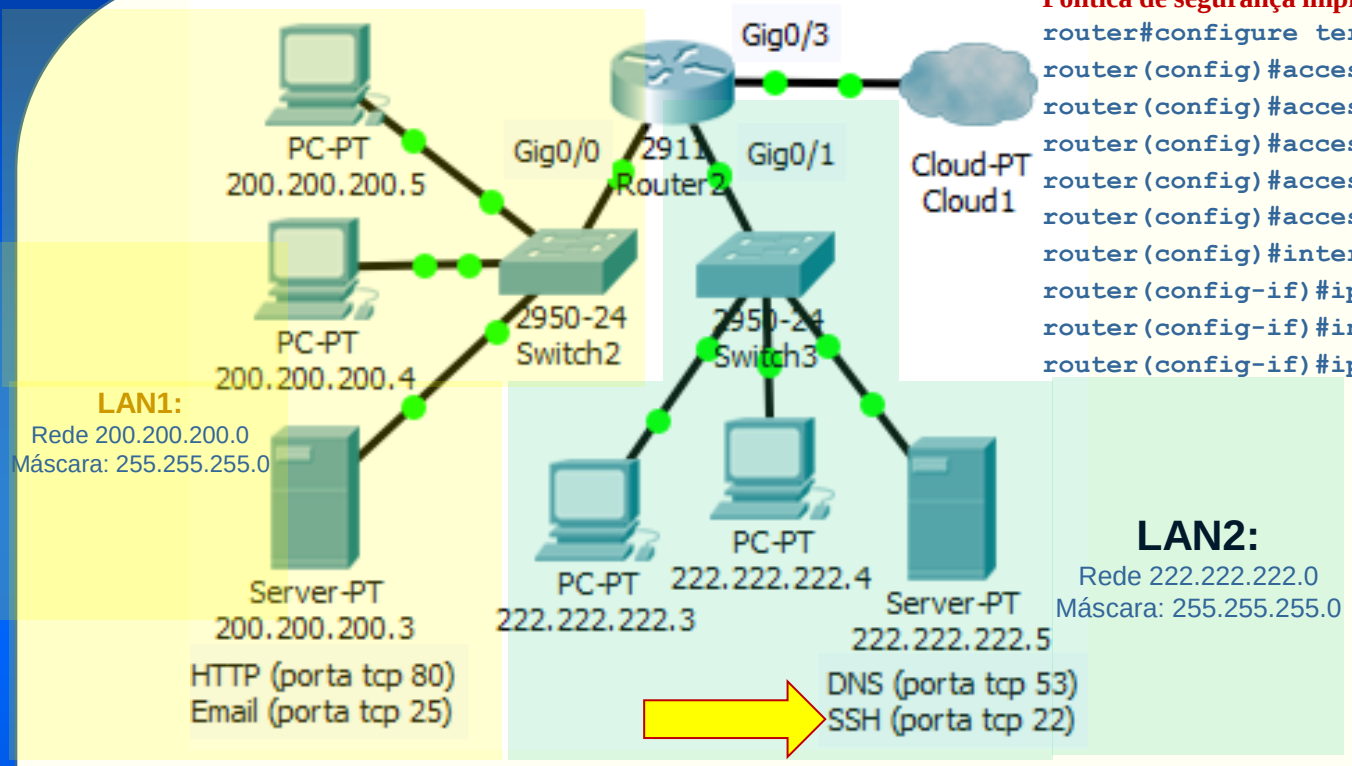
Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5
router(config)#interface gig0/3
router(config-if)#ip access-group 100 in
router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Questão 2: Quais hosts poderão acessar o serviço SSH (QUE UTILIZA PORTA TCP 22) no servidor 222.222.222.5.

Todos os hosts da rede interna possuem acesso ao serviço SSH (QUE UTILIZA PORTA TCP 22) no servidor 222.222.222.5 uma vez que o tráfego não passa pelo roteador.
A regra 101 bloqueia qualquer tráfego de fora da rede do servidor 200.200.200.3

Analise o cenário a seguir (2º Checkpoint): Prova 1



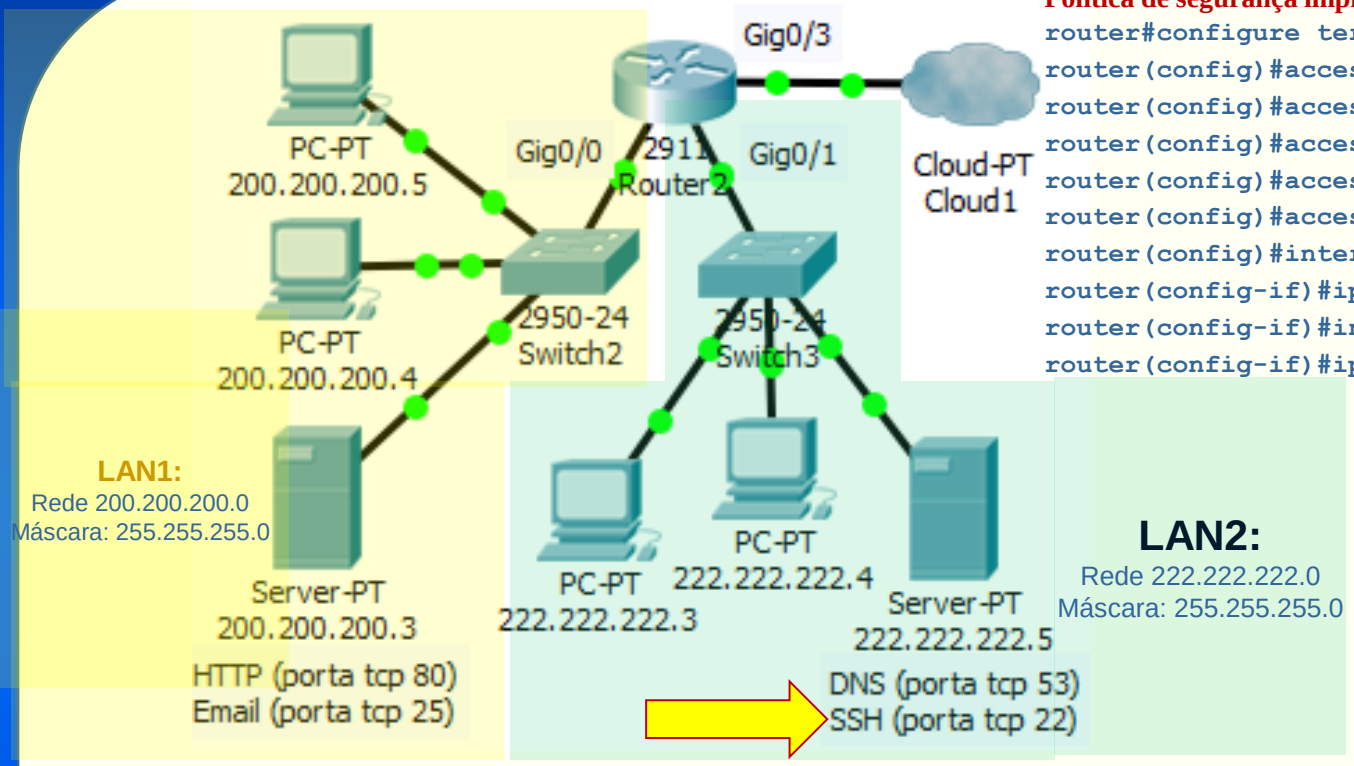
Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5
router(config)#interface gig0/3
router(config-if)#ip access-group 100 in
router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Questão 3 Apresente todos os comandos necessários para que o host 222.222.222.3 e o host 222.222.222.4 tenham acesso à INTERNET somente ao serviço de HTTP (QUE UTILIZA PORTA TCP 80). Os demais hosts e servidores na rede da empresa NAC4 LTDA poderão acessar qualquer serviço na Internet.

```
router#configure terminal
router(config)#access-list 102 permit tcp host 222.222.222.3  any  eq 80
router(config)#access-list 102 permit tcp host 222.222.222.4  any  eq 80
router(config)#access-list 102 deny   ip  host 222.222.222.3  any
router(config)#access-list 102 deny   ip  host 222.222.222.4  any
router(config)#access-list 102 permit ip  any         any
ou
router(config)#access-list 102 deny   tcp host 222.222.222.3  any  neq 80
router(config)#access-list 102 deny   tcp host 222.222.222.3  any  neq 80
router(config)#access-list 102 permit ip  any                  any
router(config-if)#interface gig0/3
router(config-if)#ip access-group 102 out
```

Analise o cenário a seguir (2º Checkpoint): Prova 1



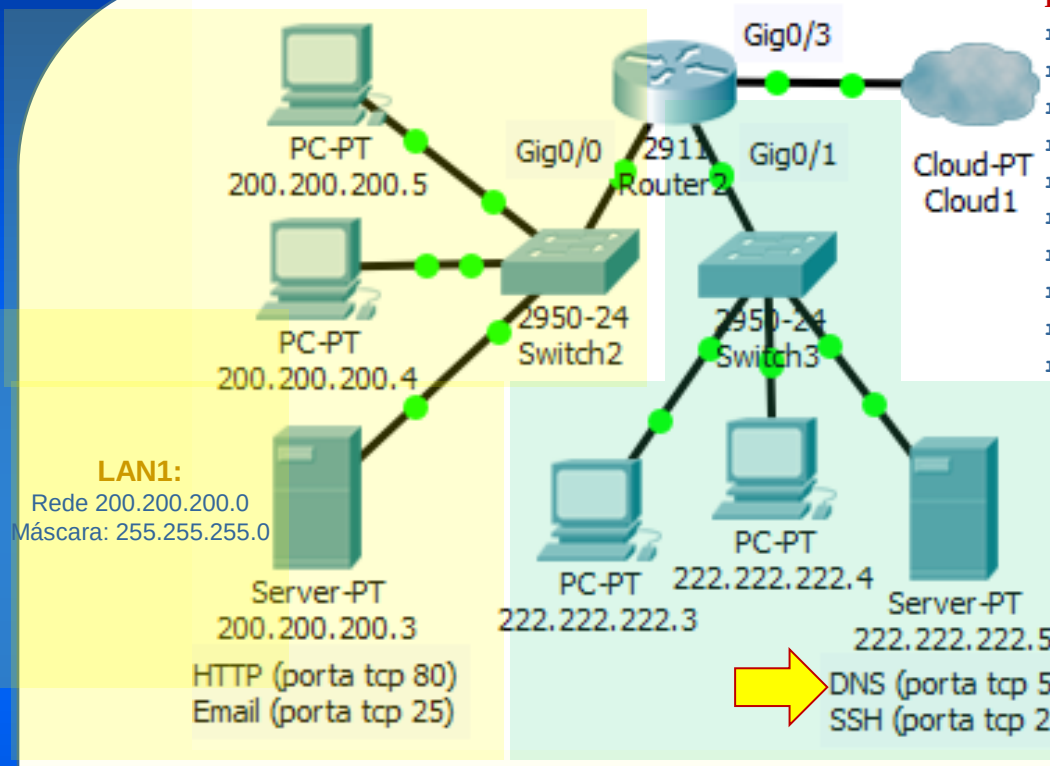
Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5
router(config)#interface gig0/3
router(config-if)#ip access-group 100 in
router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Questão 3 Apresente todos os comandos necessários para que o host 222.222.222.3 e o host 222.222.222.4 tenham acesso à INTERNET somente ao serviço de HTTP (QUE UTILIZA PORTA TCP 80). Os demais hosts e servidores na rede da empresa NAC4 LTDA poderão acessar qualquer serviço na Internet.

```
router#configure terminal
router(config)#access-list 102 permit tcp host 222.222.222.3  any  eq 80
router(config)#access-list 102 permit tcp host 222.222.222.4  any  eq 80
router(config)#access-list 102 deny   ip  host 222.222.222.3  any
router(config)#access-list 102 deny   ip  host 222.222.222.4  any
router(config)#access-list 102 permit ip  any         any
ou
router(config)#access-list 102 deny   tcp host 222.222.222.3  any  neq 80
router(config)#access-list 102 deny   tcp host 222.222.222.3  any  neq 80
router(config)#access-list 102 permit ip  any                  any
router(config-if)#interface gig0/3
router(config-if)#ip access-group 102 out
```

Analise o cenário a seguir (2º Checkpoint): Prova 1



Política de segurança implementada no Roteador (Router2)

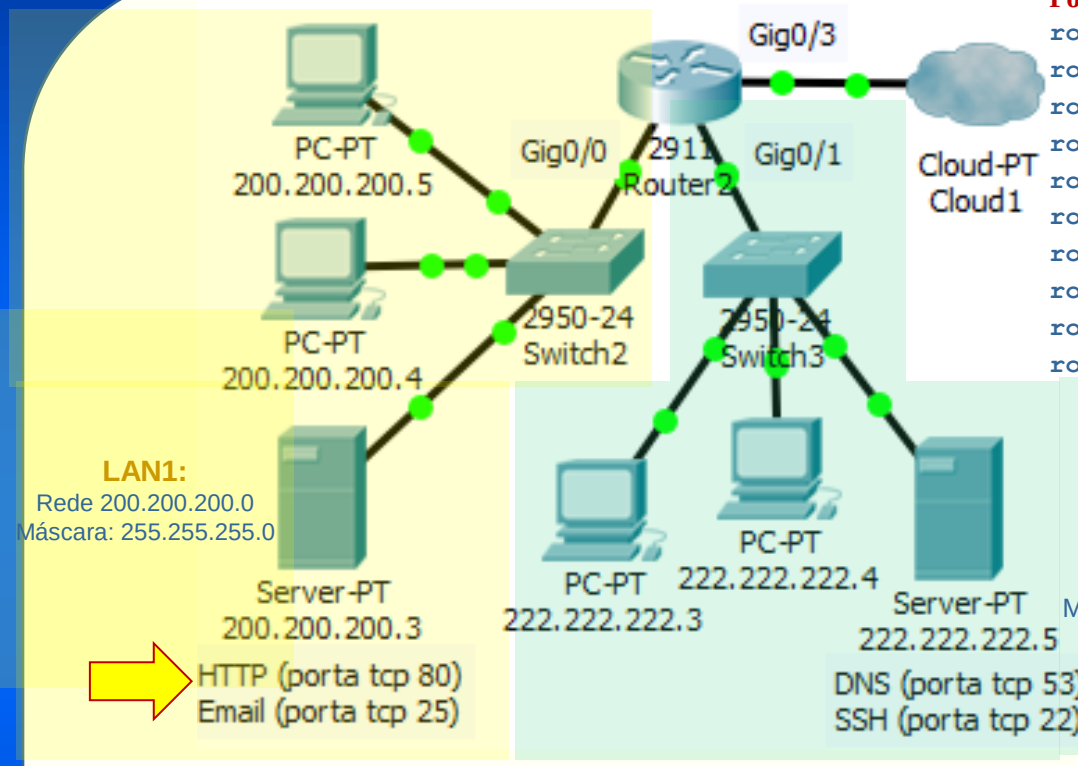
```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5
router(config)#interface gig0/3
router(config-if)#ip access-group 100 in
router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Questão 4 Apresente todos os comandos necessários para que somente os hosts 222.222.222.3 e 222.2222.222.4 tenham acesso ao serviço DNS (QUE UTILIZA PORTA TCP 53) no servidor 222.222.222.5. O acesso aos demais serviços neste servidor deverão estar liberados para estes equipamentos e também liberados para qualquer outra origem, incluindo a Internet. Qualquer tipo de tráfego, de qualquer origem, endereçado aos hosts da rede 222.222.222.0 não poderão passar pelo roteador. O acesso a qualquer serviço nos hosts e servidor da rede 200.200.200.0 deverá ficar liberado para qualquer origem.

```
router#configure terminal
router(config)#access-list 103 deny        tcp   any       host 222.222.222.5  eq 53
router(config)#access-list 103 permit      ip    any       host 222.222.222.5
router(config)#access-list 103 deny        ip    any       host 222.222.222.3
router(config)#access-list 103 deny        ip    any       host 222.222.222.4
router(config)#access-list 103 permit      ip    any       any

router(config-if)#interface gig0/1
router(config-if)#ip access-group 103 out
```

Analise o cenário a seguir (2º Checkpoint): Prova 1



Política de segurança implementada no Roteador (Router2)

```
router#configure terminal
router(config)#access-list 100 permit tcp host 120.120.120.5  host 200.200.200.3 eq 25
router(config)#access-list 100 deny   tcp any  host 200.200.200.3  eq 25
router(config)#access-list 100 permit ip  any  any
router(config)#access-list 101 deny   tcp any  host 222.222.222.5  eq 22
router(config)#access-list 101 permit ip  any  host 222.222.222.5
router(config)#interface gig0/3
router(config-if)#ip access-group 100 in
router(config-if)#interface gig0/1
router(config-if)#ip access-group 101 in
```

Questão 5 Apresente todos os comandos necessários para que somente os hosts e servidores existentes na rede 200.200.200.0 e 222.222.222.0 tenham acesso ao serviço HTTP (QUE UTILIZA PORTA TCP 80) no servidor 200.200.200.3. Todos os hosts e servidores da rede 200.200.200.0, da rede 222.222.222.0 e da Internet poderão acessar qualquer outro serviço neste servidor (exceto os já configurados anteriormente). O acesso aos hosts da rede 200.200.200.0 deverá

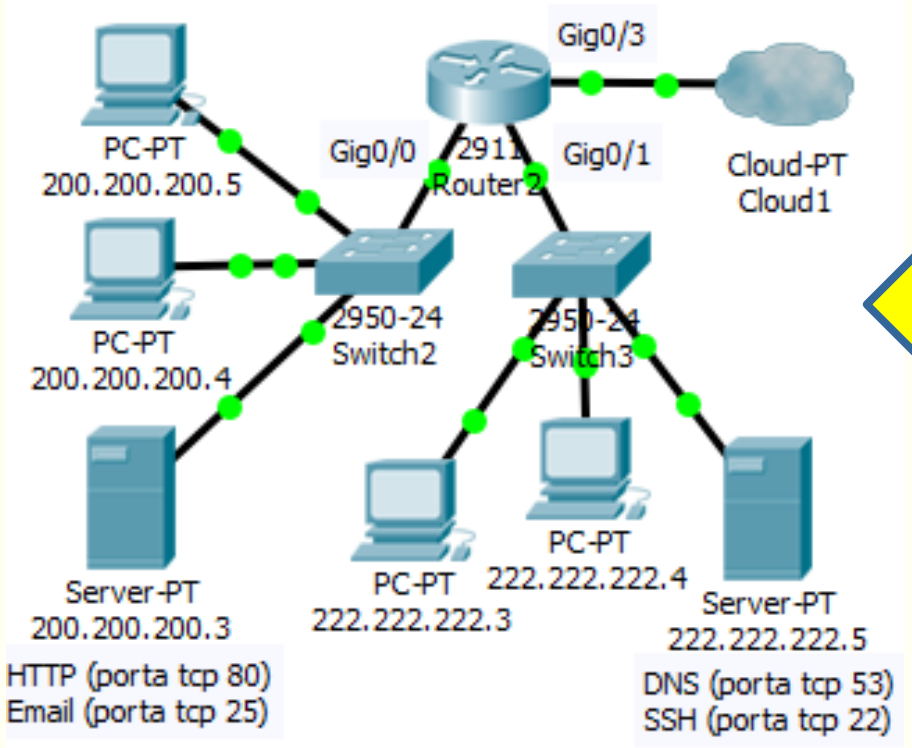
```
router#configure terminal
router(config)#access-list 104 permit  tcp host 222.222.222.3 host 200.200.200.3  eq 80
router(config)#access-list 104 permit  tcp host 222.222.222.3 host 200.200.200.3  eq 80
router(config)#access-list 104 deny    tcp any                host 200.200.200.3  eq 80
router(config)#access-list 104 permit  ip  any                host 200.200.200.3
router(config)#access-list 104 deny    ip  any                host 200.200.200.3
router(config)#access-list 104 deny    ip  any                host 200.200.200.4

router(config-if)#interface gig0/0
router(config-if)#ip access-group 104 out
```

- Aula 10 -

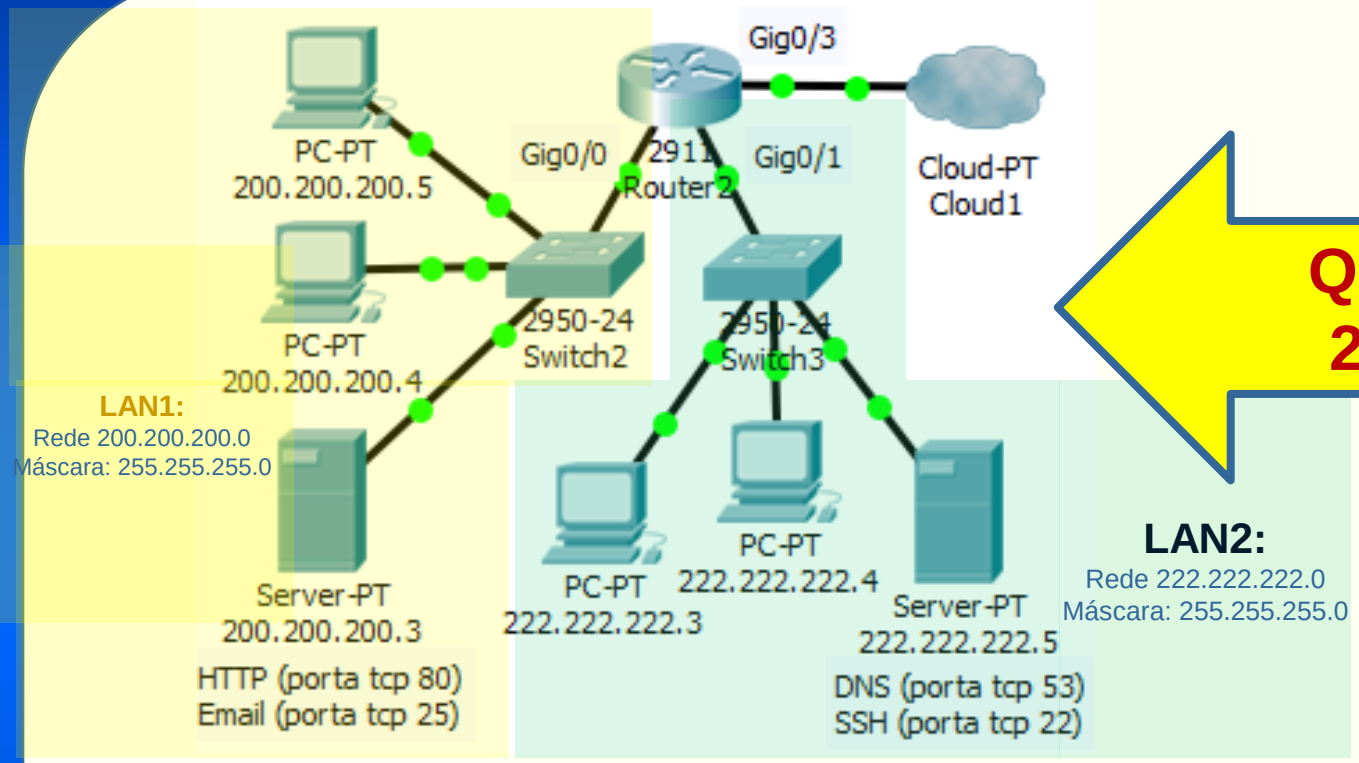
- Configurando ACLs e VLANs – Combinação de 2 conceitos importantes

Análise o Cenário a seguir



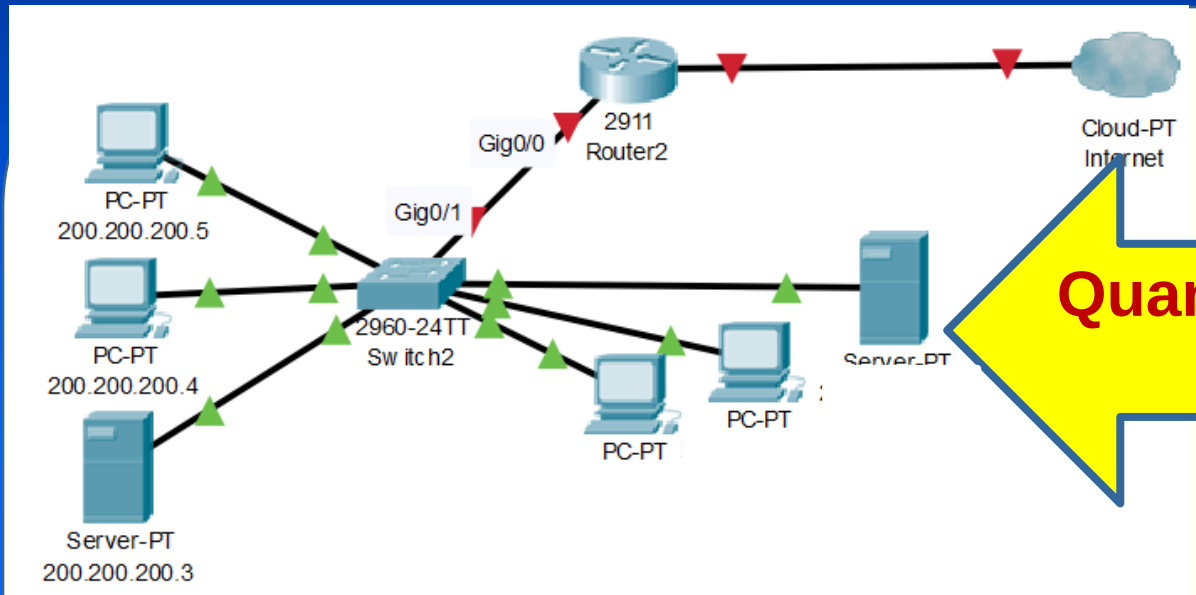
Quantas redes locais (LANs)?

Analise o cenário a seguir (3º Checkpoint): Prova 1



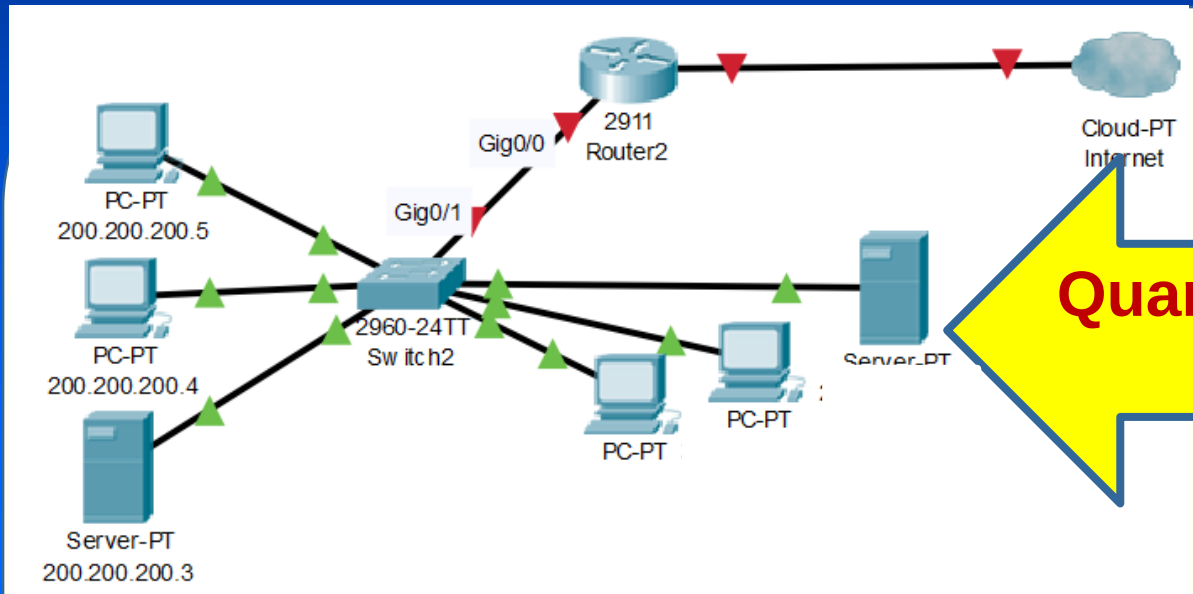
Quantas redes locais (LANs)?
2 redes locais: LAN1 e LAN2

Analise o cenário a seguir



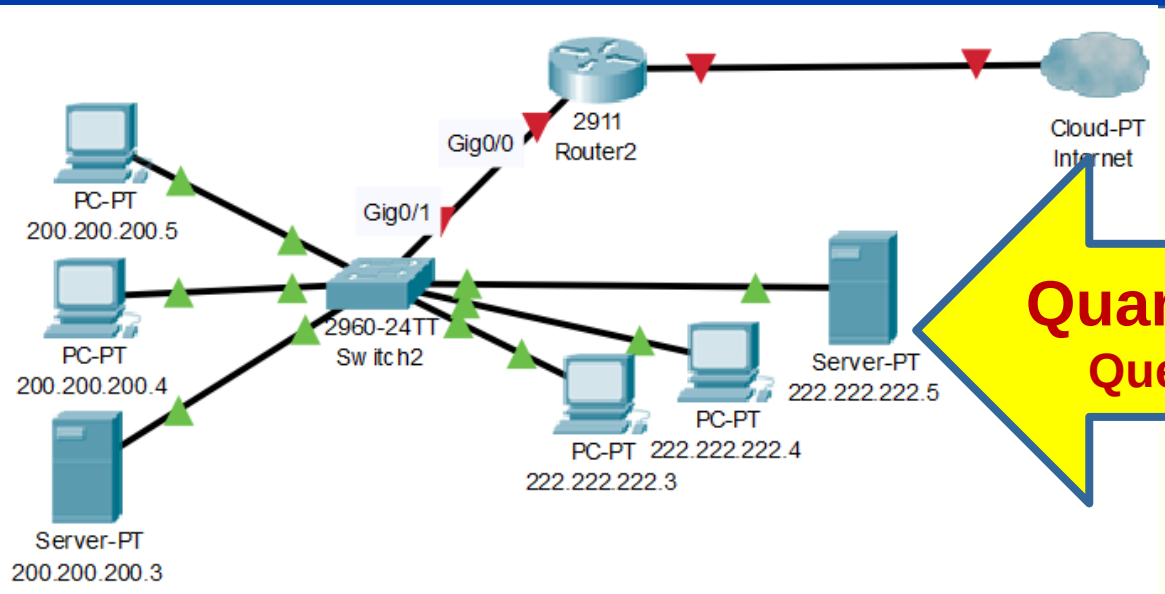
Quantas redes locais (LANs)?

Analise o cenário a seguir



Quantas redes locais (LANs)?
Oringalmente, 1 LAN

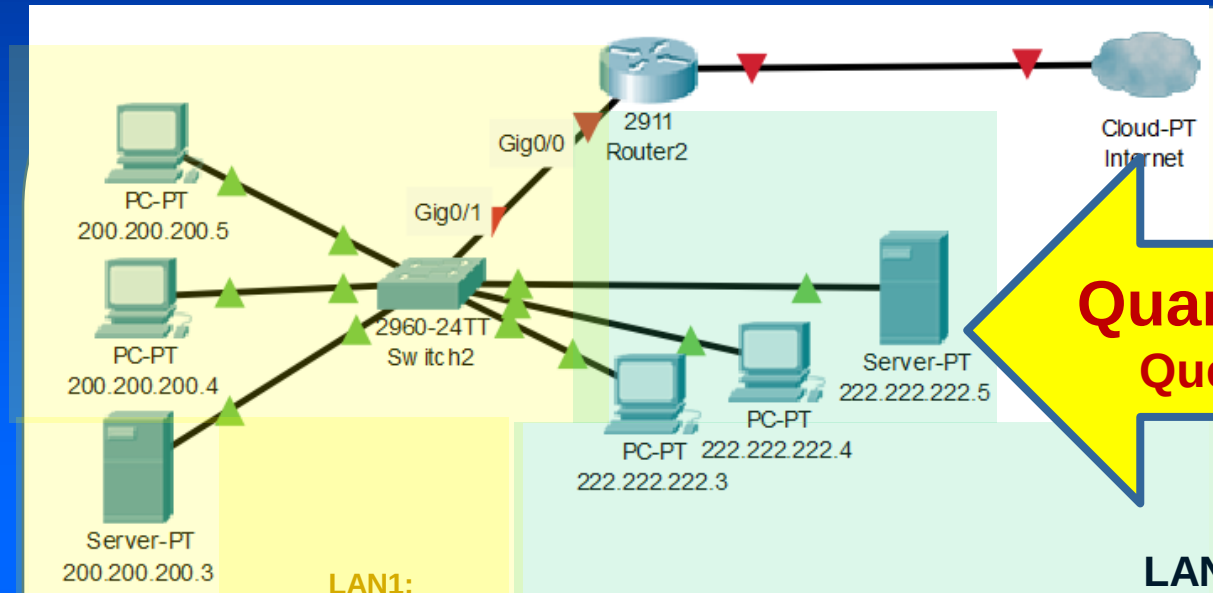
Analise o cenário a seguir



Quantas redes locais (LANs)?

Queremos 2 redes Locais (VLANs)

Analise o cenário a seguir



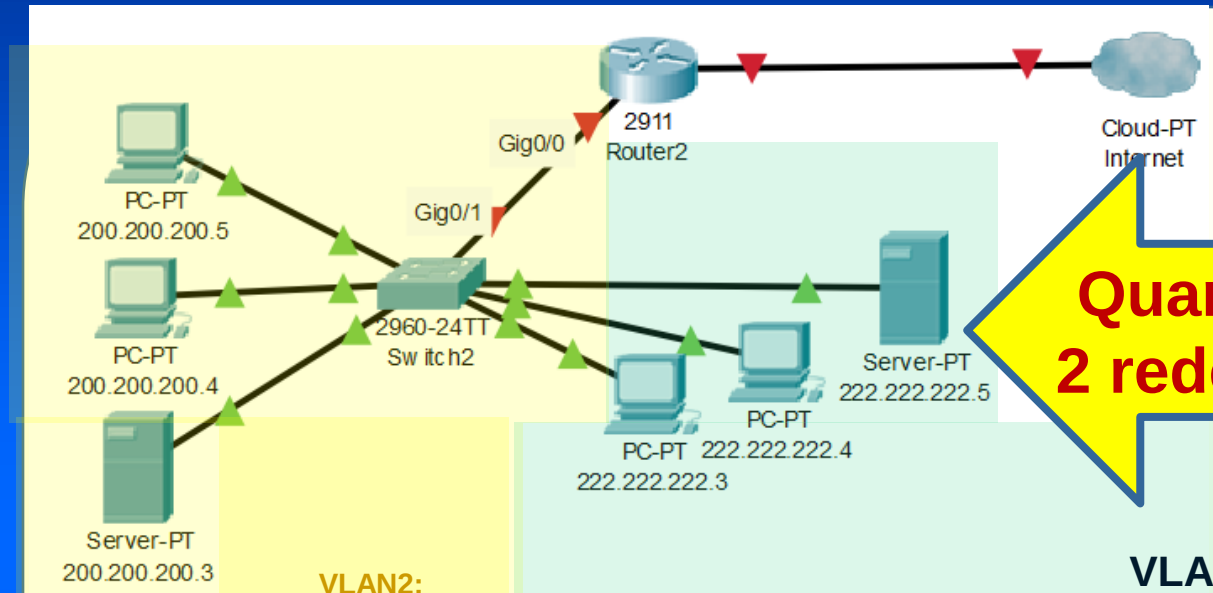
Quantas redes locais (LANs)?

Queremos 2 redes Locais (VLANs)

LAN1:
Rede 200.200.200.0
Máscara: 255.255.255.0

LAN2:
Rede 222.222.222.0
Máscara: 255.255.255.0

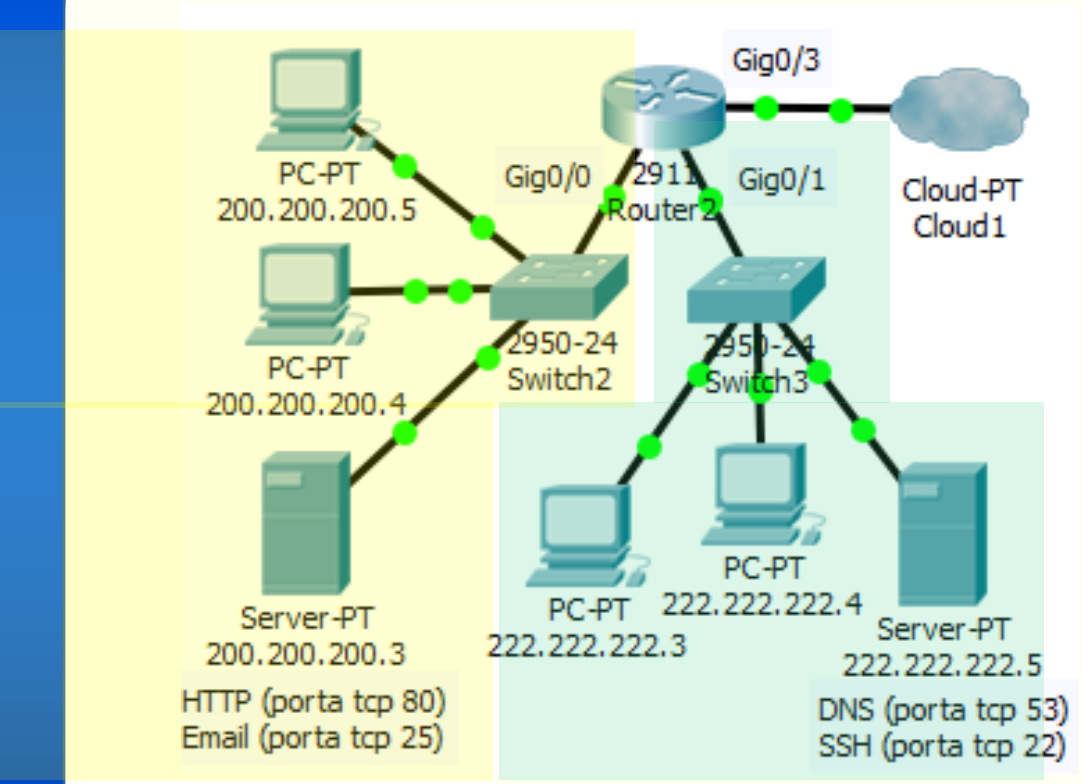
Analise o cenário a seguir



Quantas redes locais (LANs)?
2 redes locais: VLAN2 e VLAN3

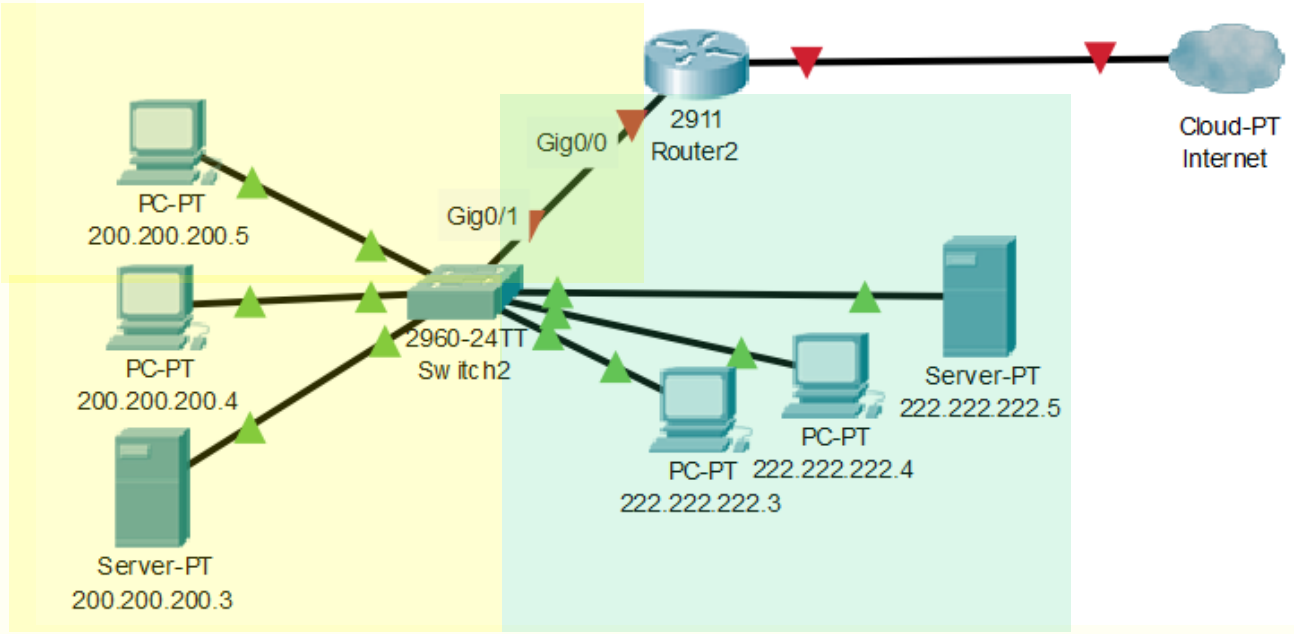
Estou utilizando VLAN2 e VLAN3
pois a VLAN1 é a VLAN default

Analise o cenário a seguir



Arquivo na área de apostilas do Portal da FIAP:

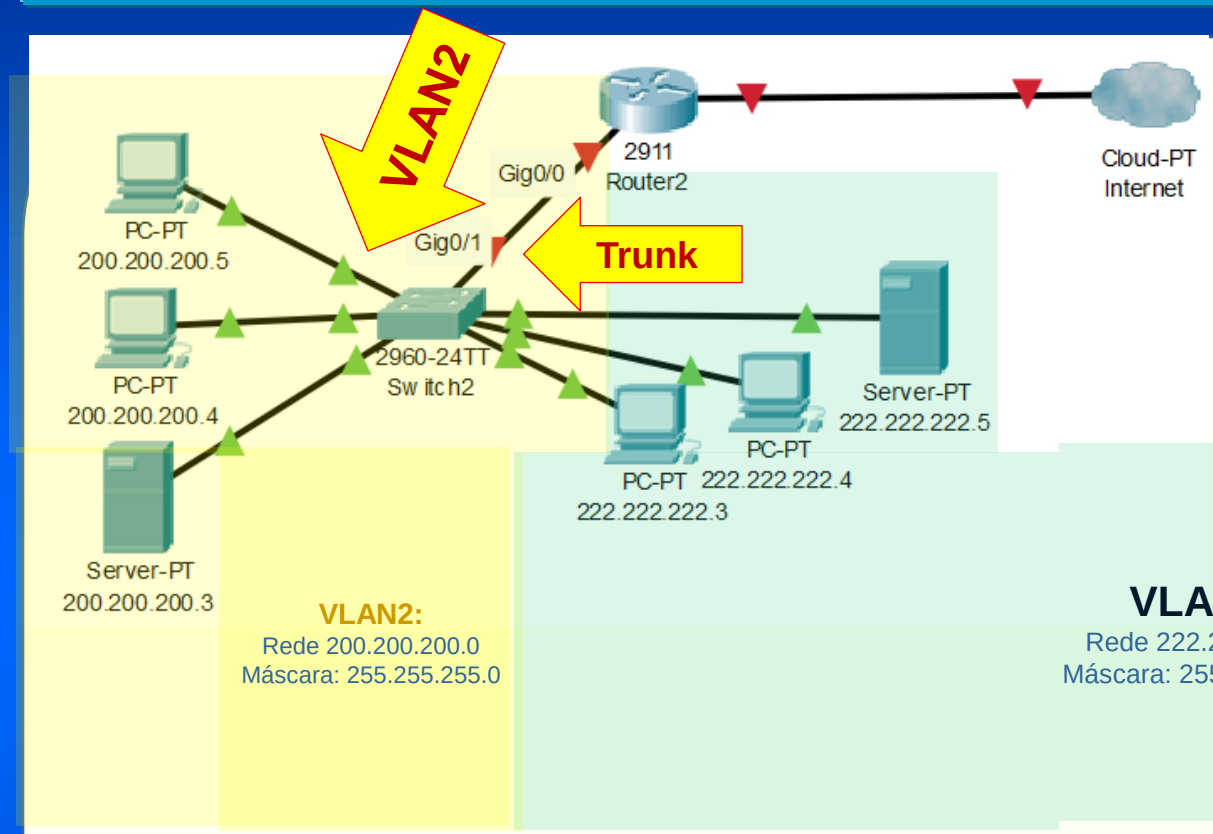
`Aula 10 2023 Checkpoint VLANs Firewall.pkt`



Arquivo na área de apostilas do Portal da FIAP:

`Aula 10 2023 Checkpoint VLANs Firewall parte II.pkt`

Configuração da VLAN2: amarela



Arquivo na área de apostilas do Portal da FIAP:

Aula 10 2023 Checkpoint VLANs Firewall parte II.pkt

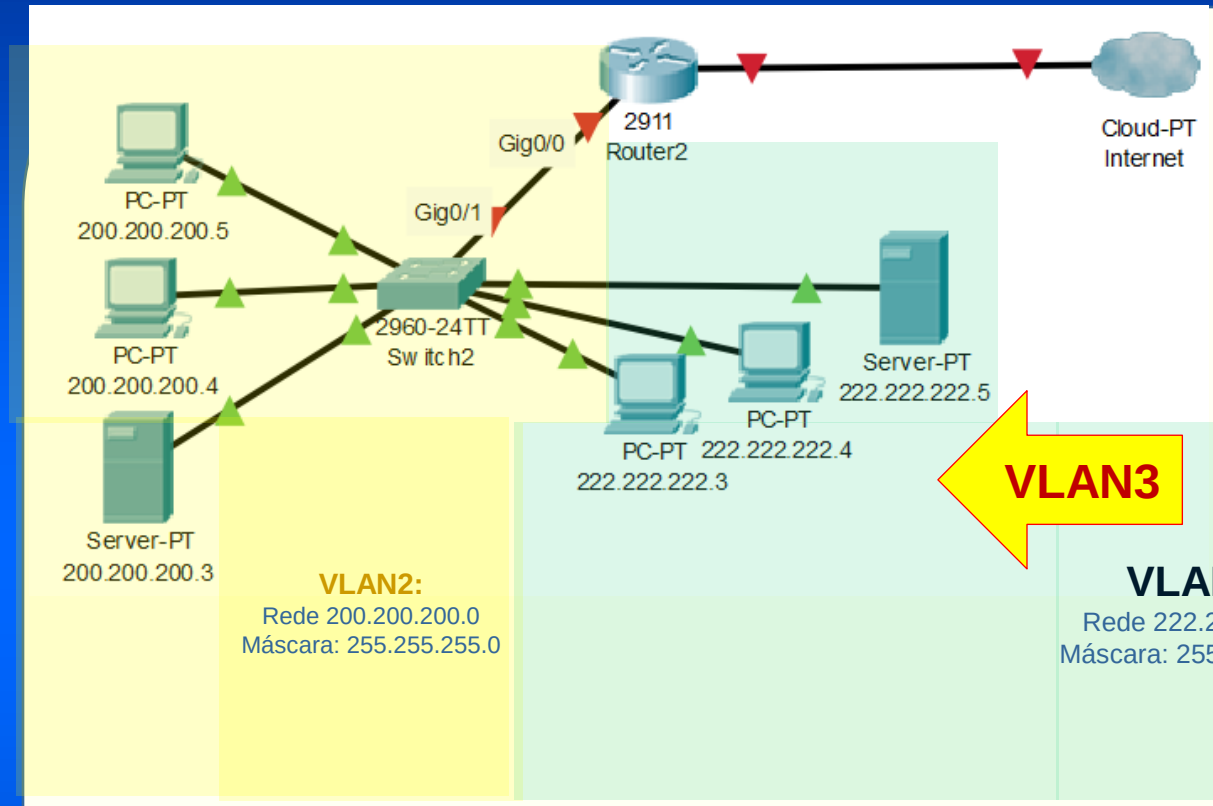
```
Switch>enable
Switch#configure terminal
Switch(config)#
Switch(config)#vlan 2
Switch(config-vlan)#name AMARELA
Switch(config-vlan)#
Switch(config-vlan)#
Switch(config-vlan)#interface range fa0/1-fa0/10
Switch(config-if-range)#switchport access vlan 2
Switch(config-if-range)#
```

VLAN2

```
Switch(config-if-range)#
Switch(config-if-range)#interface gig0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
Switch(config-if)#
```

Trunk

Configuração da VLAN3: azul



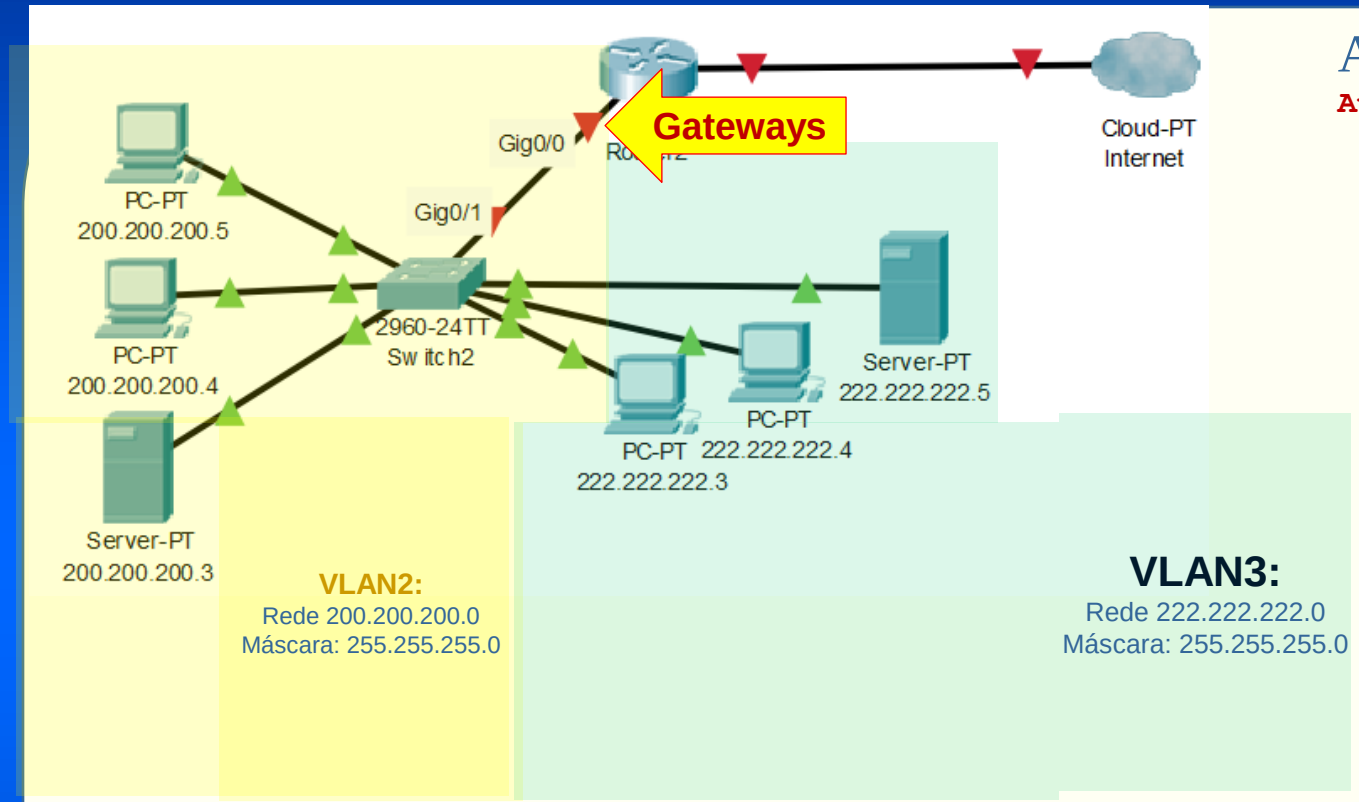
Arquivo na área de apostilas do Portal da FIAP:

Aula 10 2023 Checkpoint VLANs Firewall parte II.pkt

```
Switch>enable
Switch#configure terminal
Switch(config)#
Switch(config)#vlan 3
Switch(config-vlan)#name AZUL
Switch(config-vlan)#interface range fa0/10-fa0/24
Switch(config-if-range)#switchport access vlan 3
Switch(config-if-range)#
```

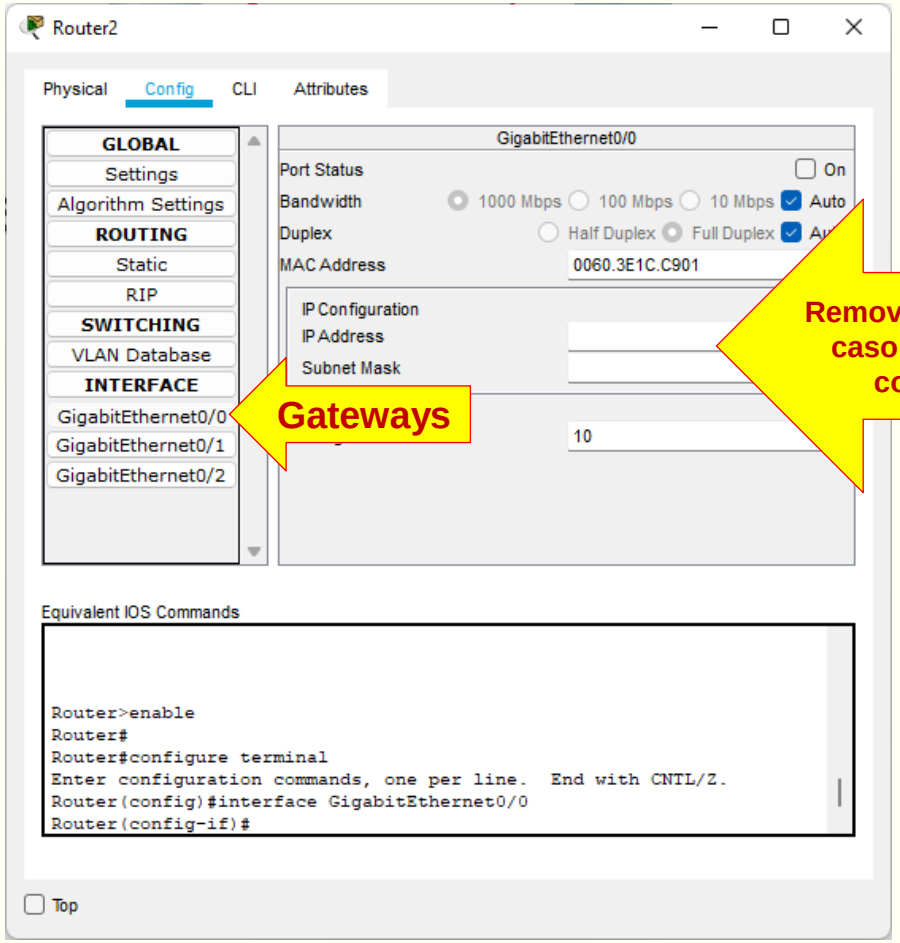
VLAN3

Configuração da subinterfaces (gateways)

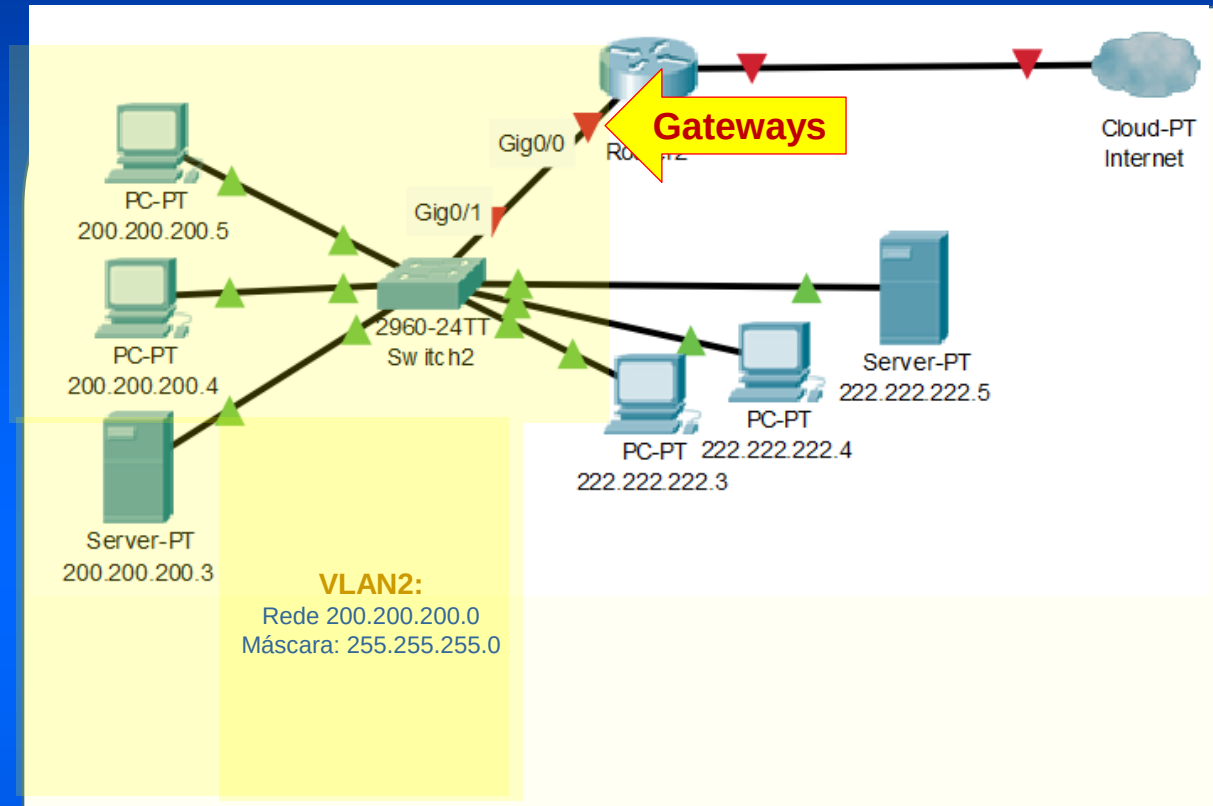


Arquivo na área de apostilas do Portal da FIAP:

Aula 10 2023 Checkpoint VLANs Firewall parte II.pkt



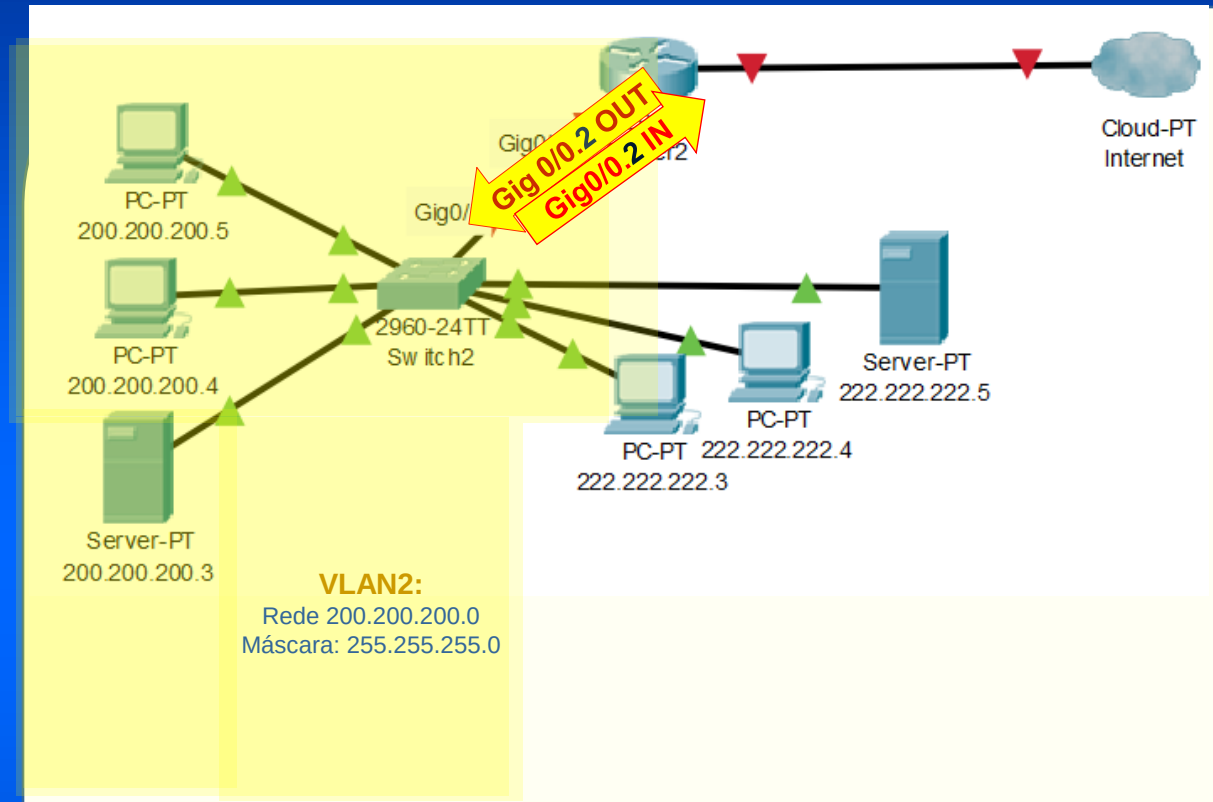
Configuração da subinterfaces (gateways)




```
Router>
Router>enable
Router#configure terminal
Router(config)#
Router(config)#interface gig0/0.2
Router(config-subif)#
Router(config-subif)#encapsulation dot1q 2
Router(config-subif)#ip address 200.200.200.1 255.255.255.0
Router(config-subif)#
```

Gateway VLAN2

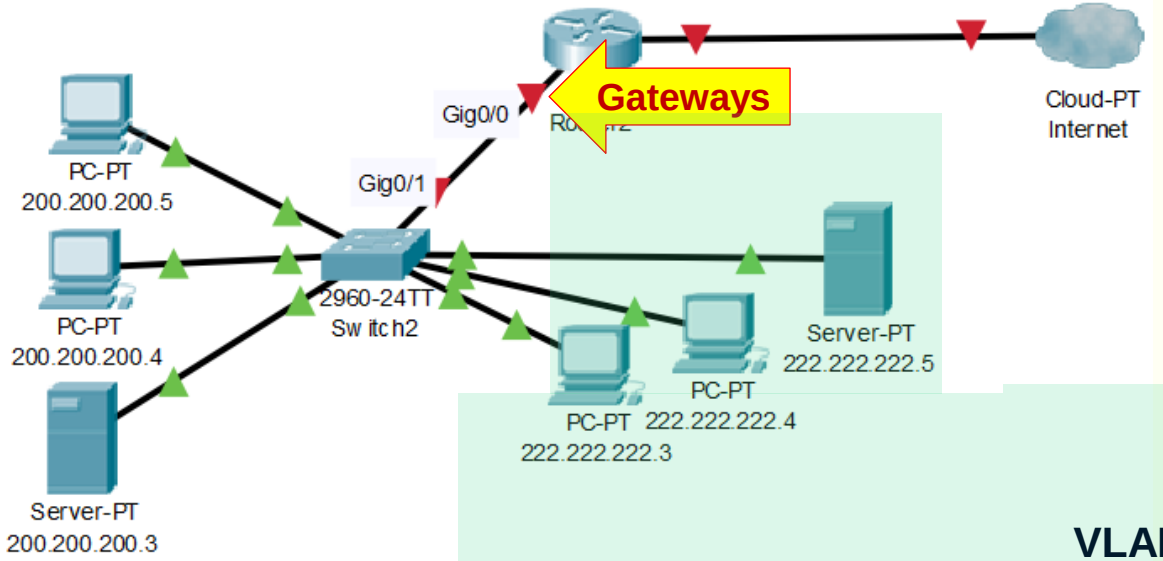
Configuração da subinterfaces (gateways)




```
Router>
Router>enable
Router#configure terminal
Router(config)#
Router(config)#interface gig0/0.2
Router(config-subif)#
Router(config-subif)#encapsulation dot1q 2
Router(config-subif)#ip address 200.200.200.1 255.255.255.0
Router(config-subif)#
```

Gateway VLAN2

Configuração da subinterfaces (gateways)

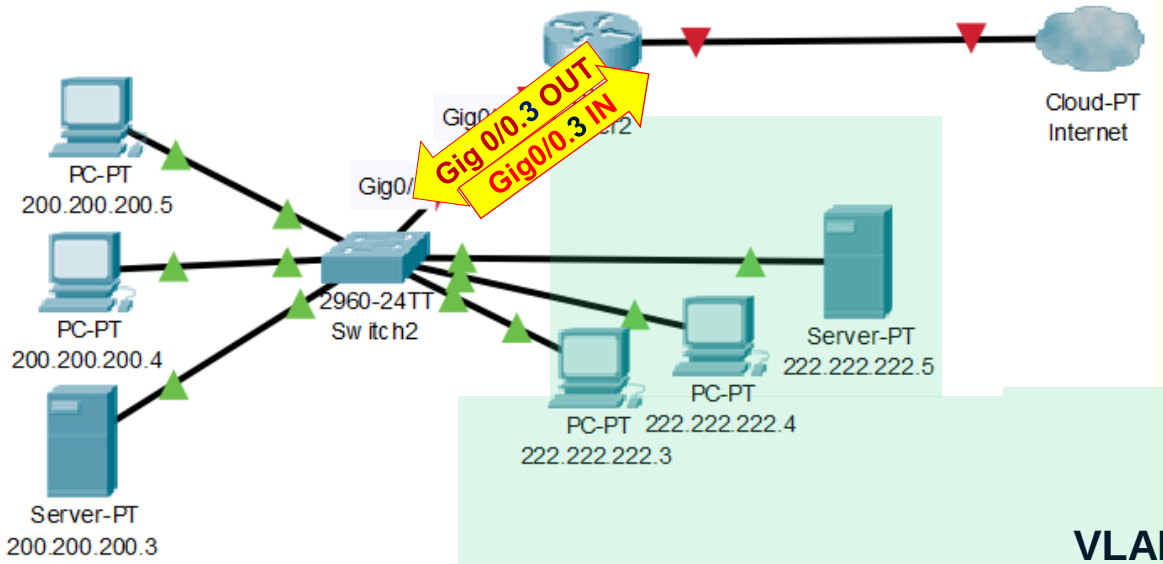


VLAN3:
Rede 222.222.222.0
Máscara: 255.255.255.0

```
Router>
Router>enable
Router#configure terminal
Router(config)#
Router(config)#interface gig0/0.2
Router(config-subif)#
Router(config-subif)#encapsulation dot1q 2
Router(config-subif)#ip address 200.200.200.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#interface gig0/0.3
Router(config-subif)#encapsulation dot1q 3
Router(config-subif)#ip address 222.222.222.1 255.255.255.0
Router(config-subif)#
```

Gateway VLAN3

Configuração da subinterfaces (gateways)

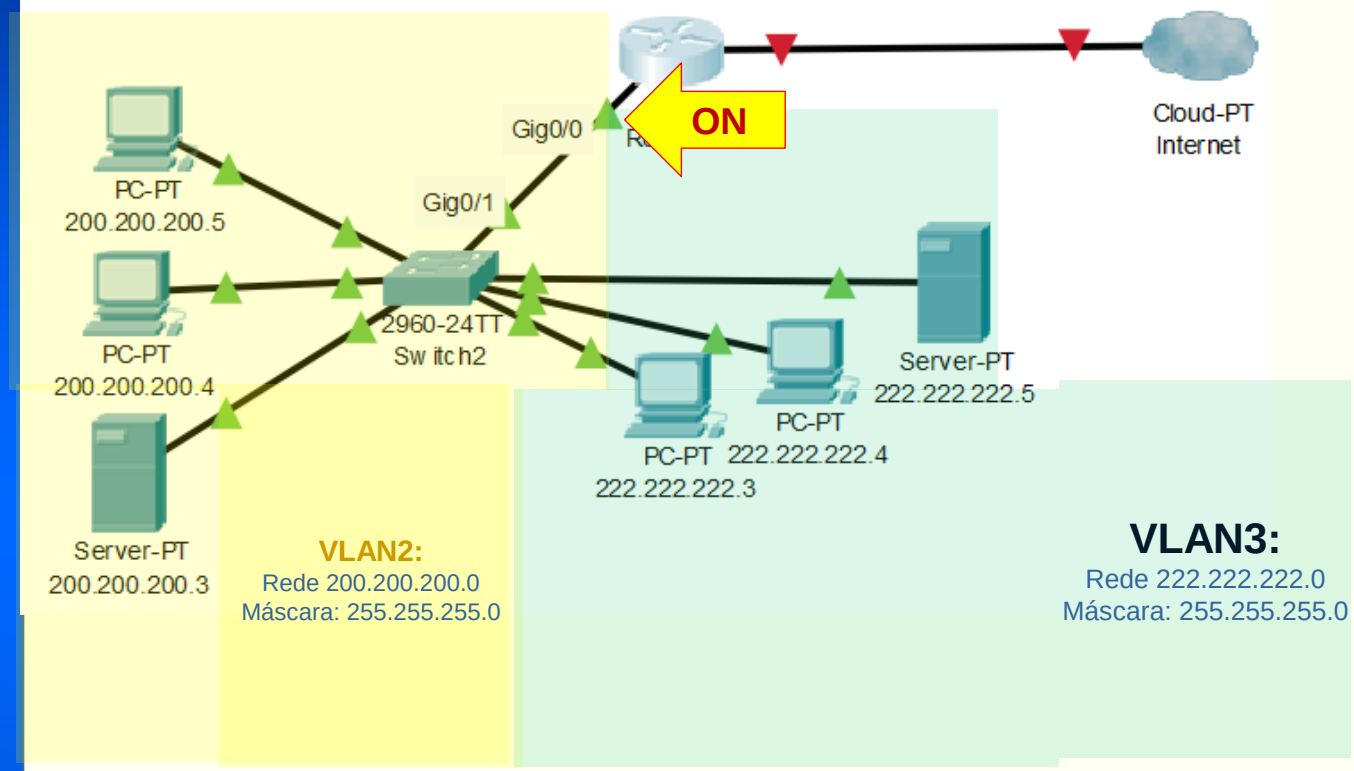


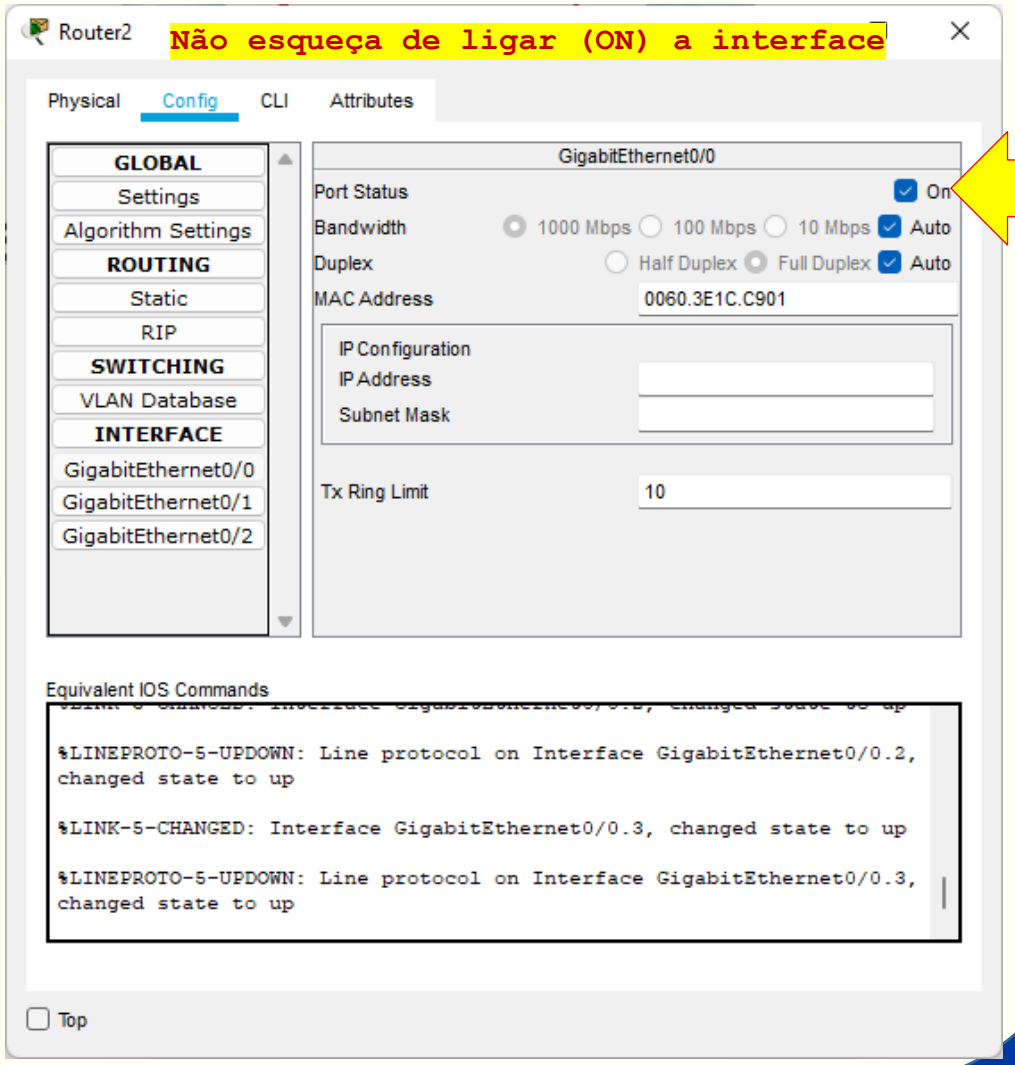
VLAN3:
Rede 222.222.222.0
Máscara: 255.255.255.0

```
Router>
Router>enable
Router#configure terminal
Router(config)#
Router(config)#interface gig0/0.2
Router(config-subif)#
Router(config-subif)#encapsulation dot1q 2
Router(config-subif)#ip address 200.200.200.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#interface gig0/0.3
Router(config-subif)#encapsulation dot1q 3
Router(config-subif)#ip address 222.222.222.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#
Router(config-subif)#interface gig0/0
Router(config-subif)#no shutdown
Router(config-subif)#
```

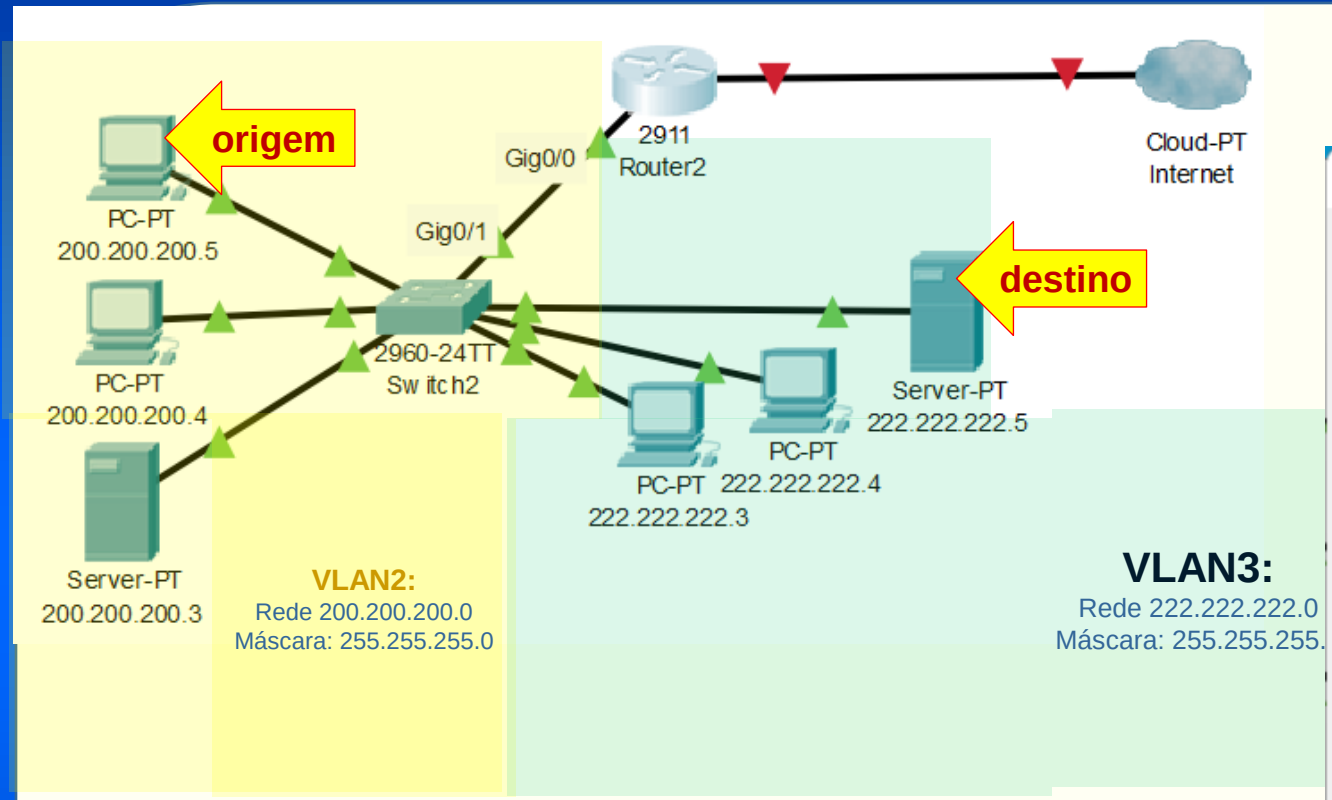
Gateway VLAN3

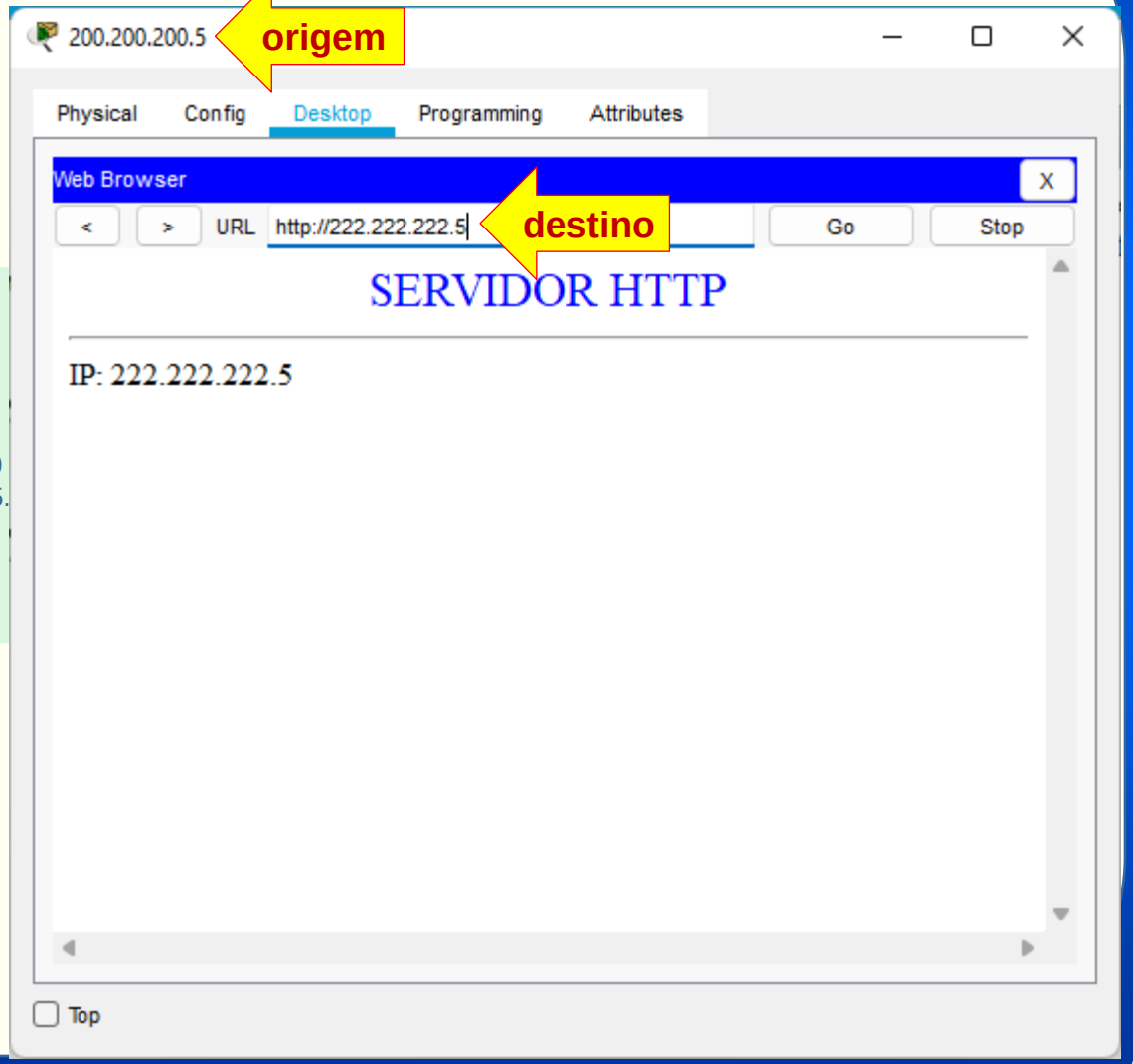
Configuração da subinterfaces (gateways)



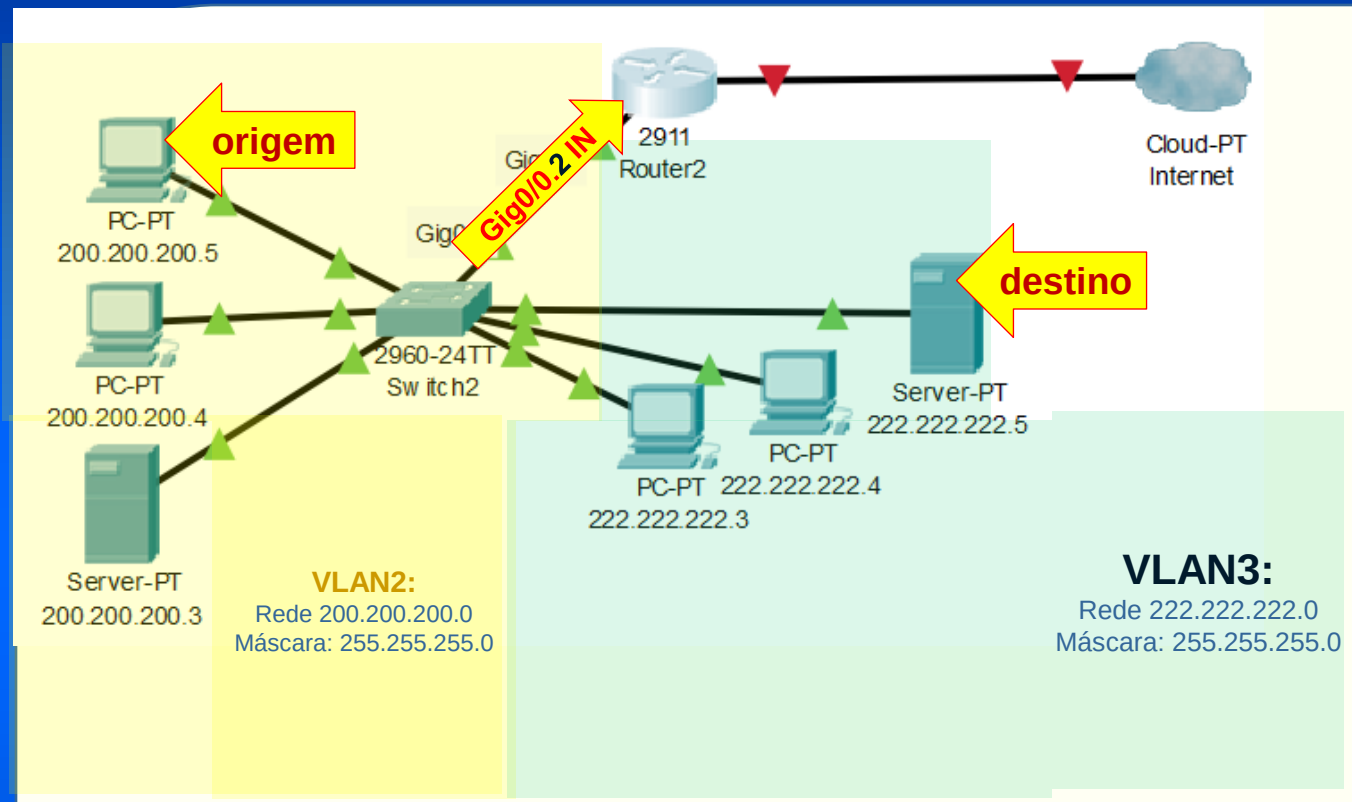


Configuração da subinterfaces (gateways)





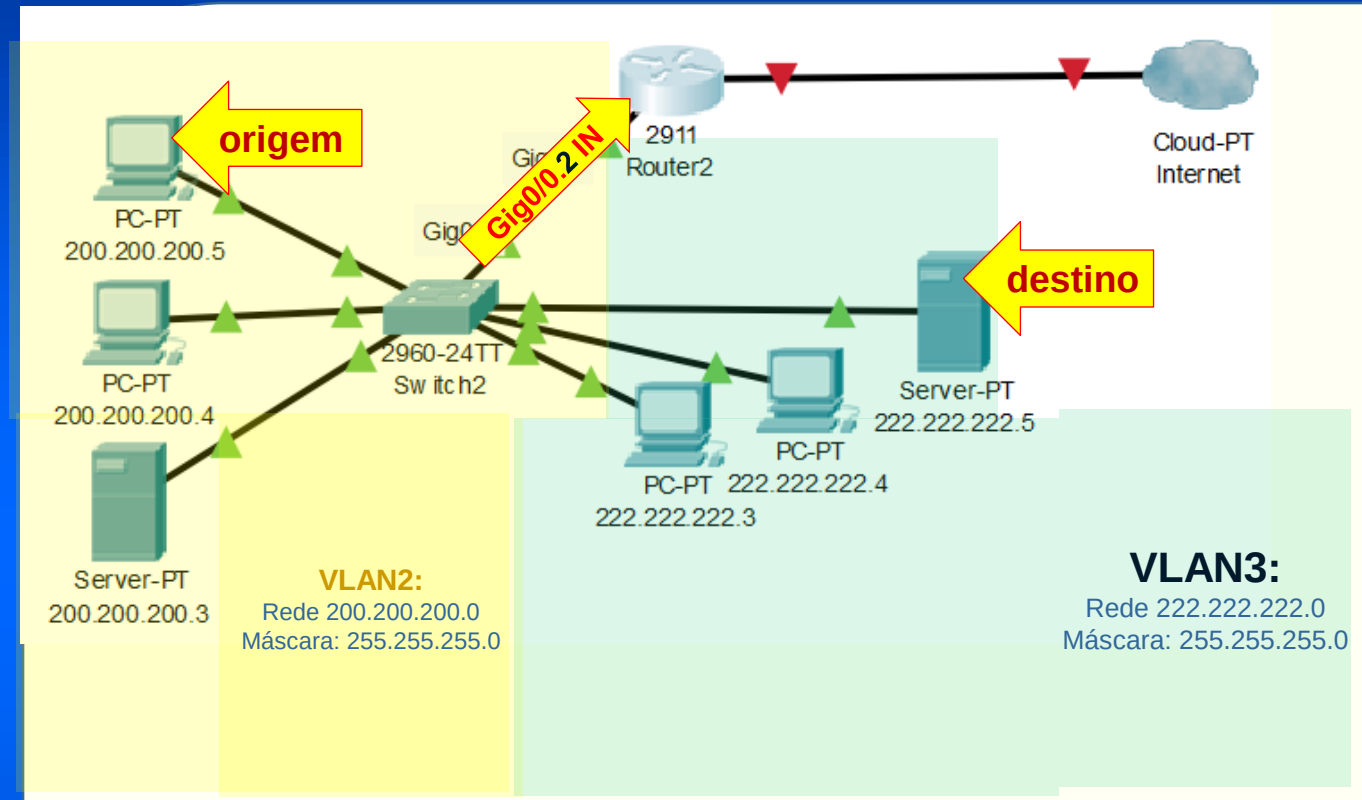
Configuração da subinterfaces (gateways)

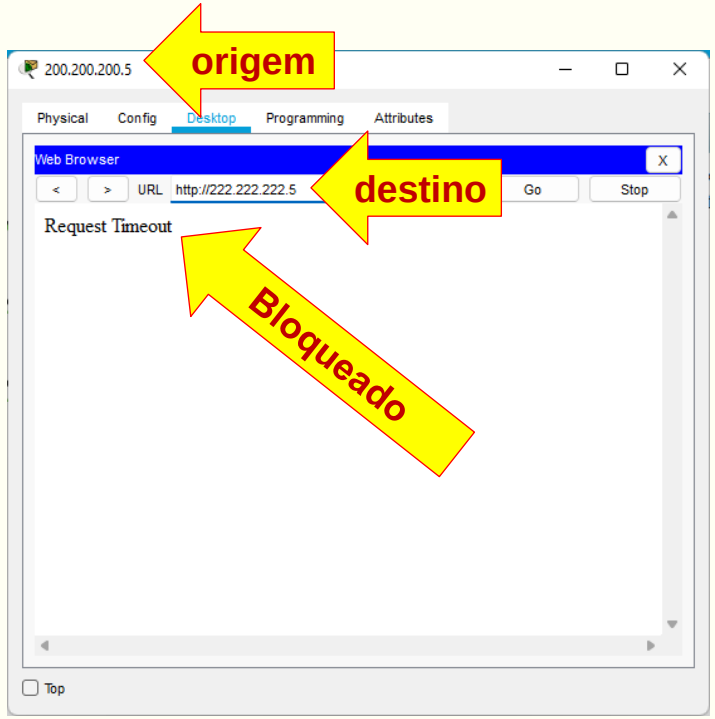


Política de Segurança: **Bloquear acesso do host 200.200.200.5 ao serviço HTTP (porta TCP 80) no servidor 222.222.222.5. Todos os demais acessos Deverão ficar liberados.**

```
Router>
Router>enable
Router#configure terminal
Router(config)#access-list 100 deny tcp host 200.200.200.5 host 222.222.222.5 eq 80
Router(config)#access-list 100 permit ip any any
Router(config)#
Router(config)#interface gig0/0.2
Router(config)#ip access-group 100 in
```

Configuração da subinterfaces (gateways)



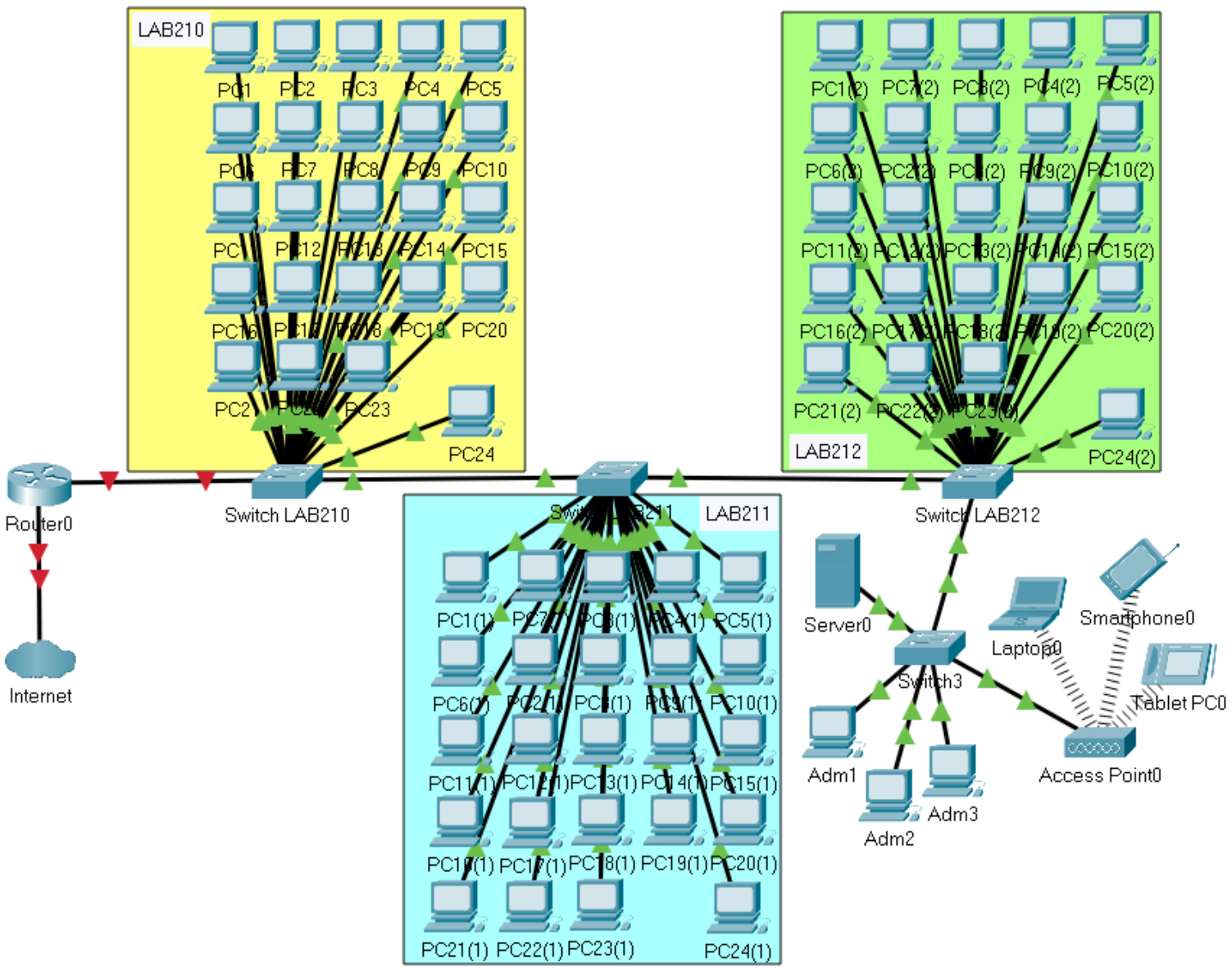


Política de Segurança: Bloquear acesso do host 200.200.200.5 ao serviço HTTP (porta TCP 80) no servidor 222.222.222.5. Todos os demais acessos Deverão ficar liberados.

```
Router>
Router>enable
Router#configure terminal
Router(config)#access-list 100 deny tcp host 200.200.200.5 host 222.222.222.5 eq 80
Router(config)#access-list 100 permit ip any any
Router(config)#
Router(config)#interface gig0/0.2
Router(config)#ip access-group 100 in
```

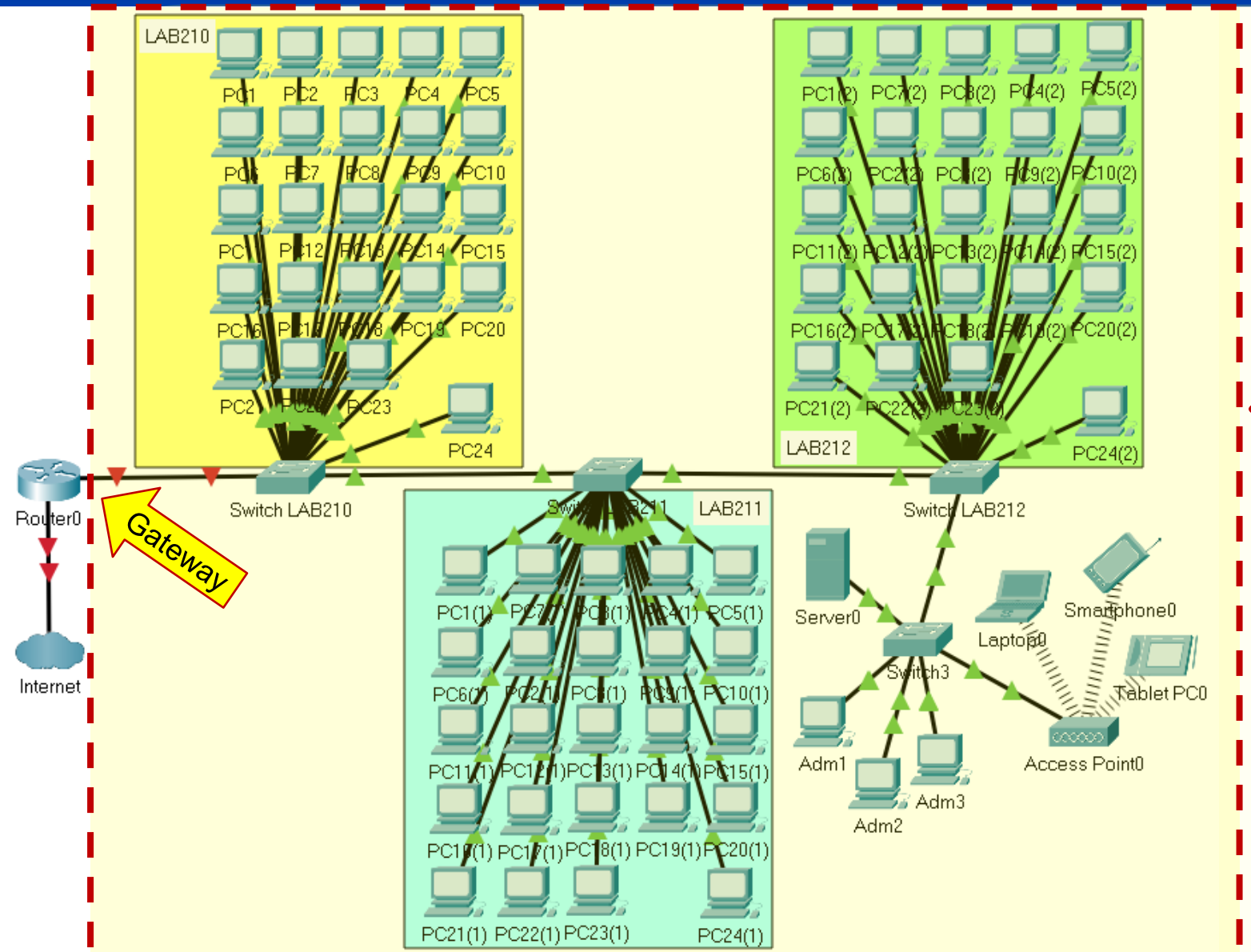
- REVISÃO VLAN -

Cenário Proposto: Aula 03 PráticacomSwitcheseVlan 2021.pkt



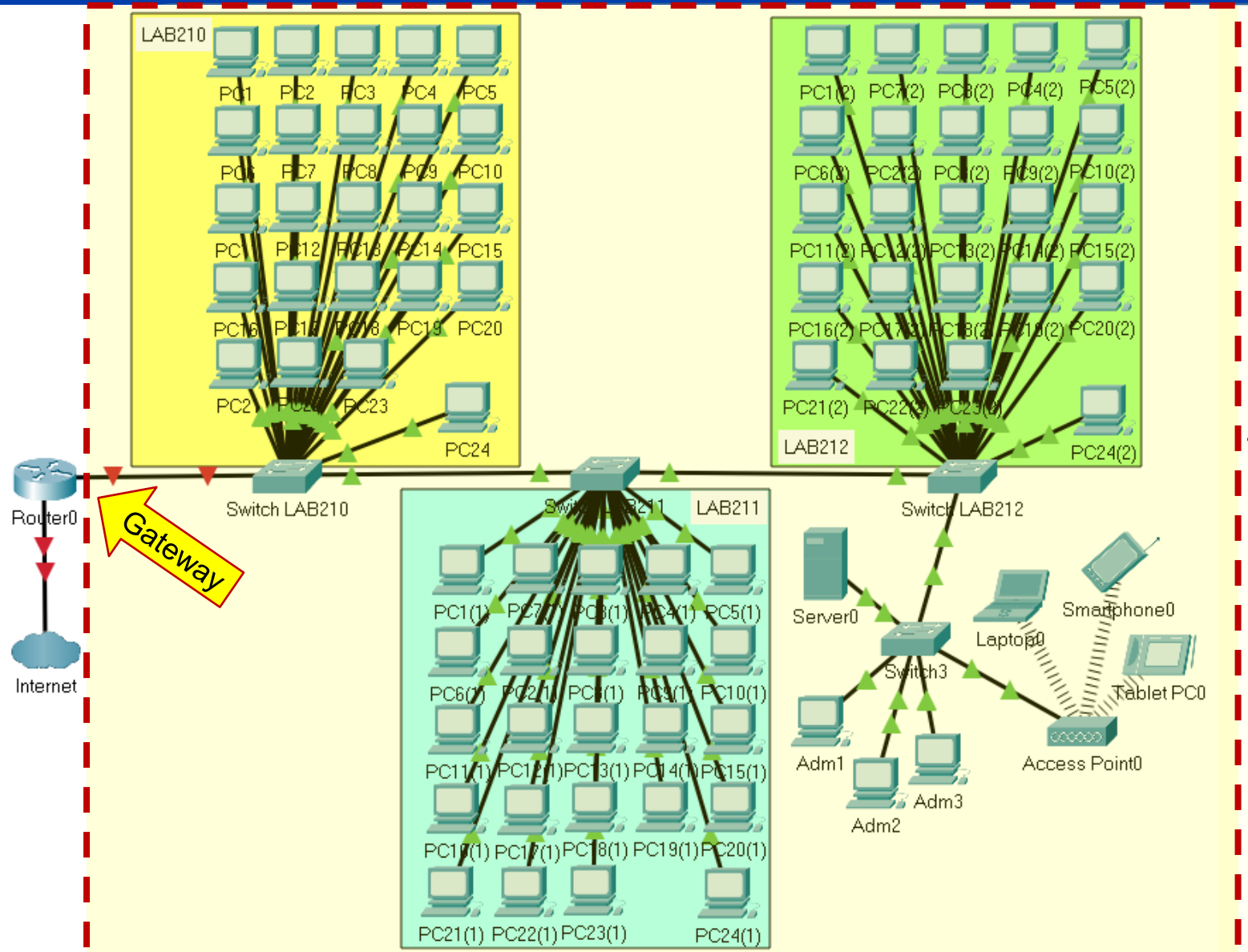
- Neste cenário temos 3 laboratórios de uma instituição de ensino com 24 equipamentos desktops cada uma: 23 para alunos e 1 para o professor (PC24);
- Há um setor administrativo com 3 desktops
- No servidor existente na organização estão os sistemas financeiros e acadêmicos
- Um Access-point permite o acesso à rede por meio de tecnologia Wi-fi.
- Não foi realizada nenhuma configuração neste cenário: os equipamentos estão da mesma forma como entregues pelo fornecedor.

Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt



A topologia física apresenta uma **única rede com um único domínio de broadcast**

Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt

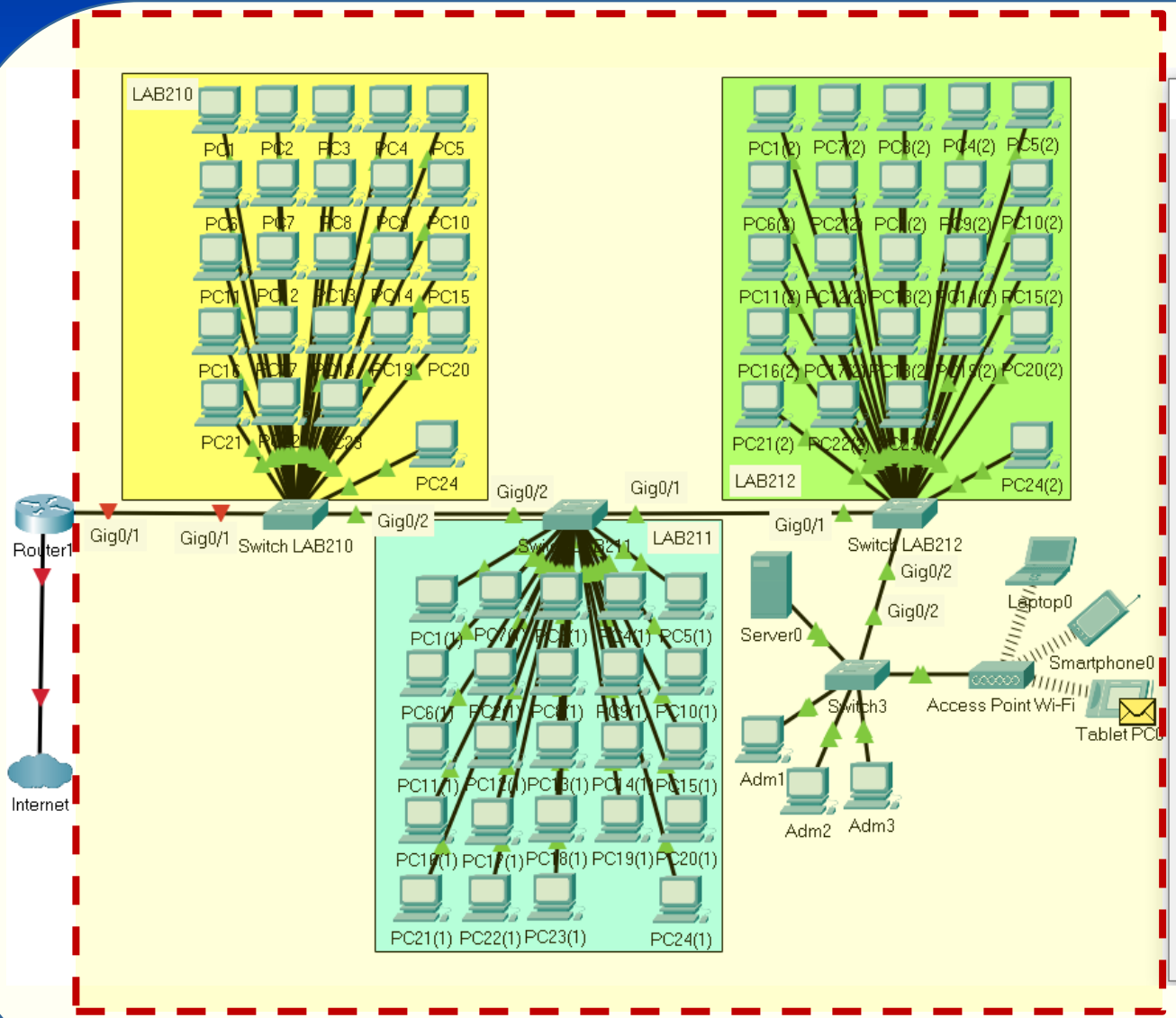


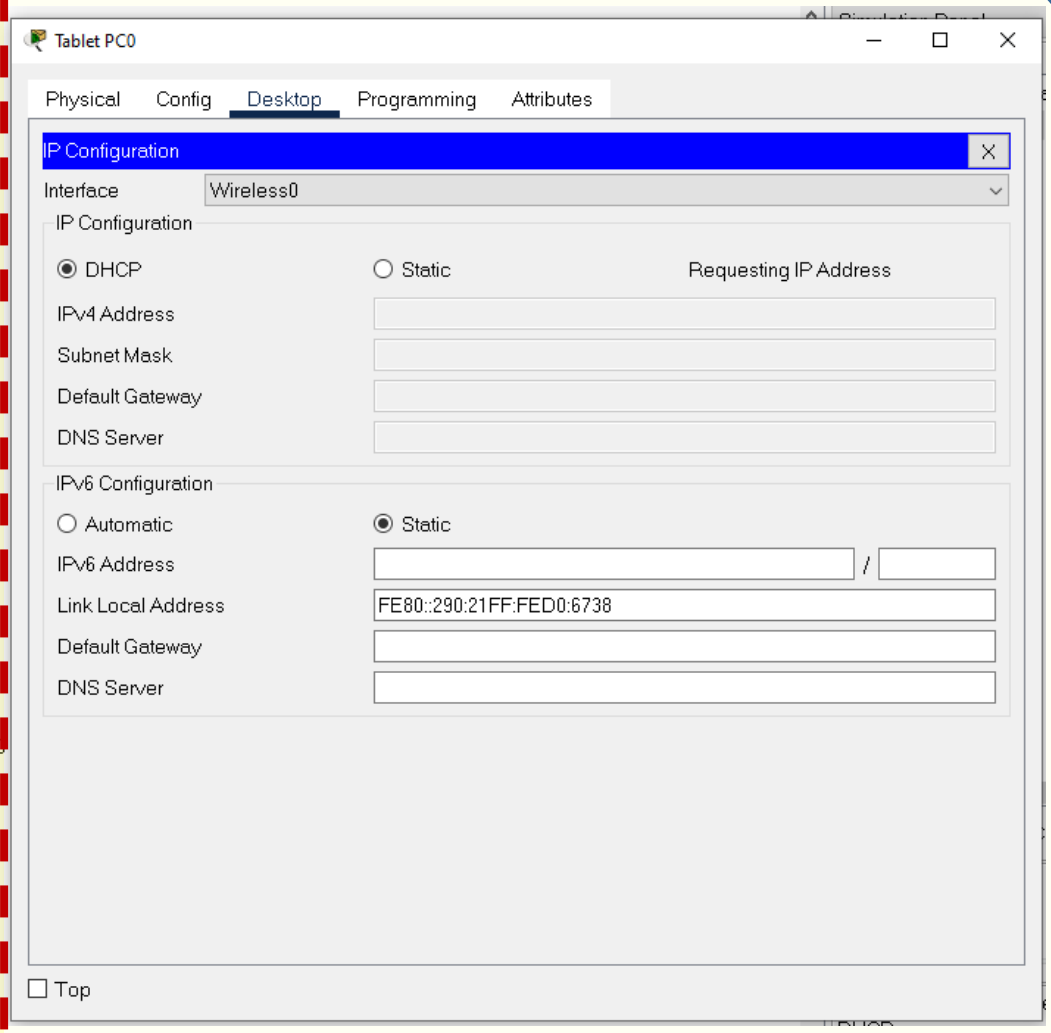
Problemas a considerar:

Desempenho: Todos os dispositivos serão impactados por broadcasts gerados na rede local

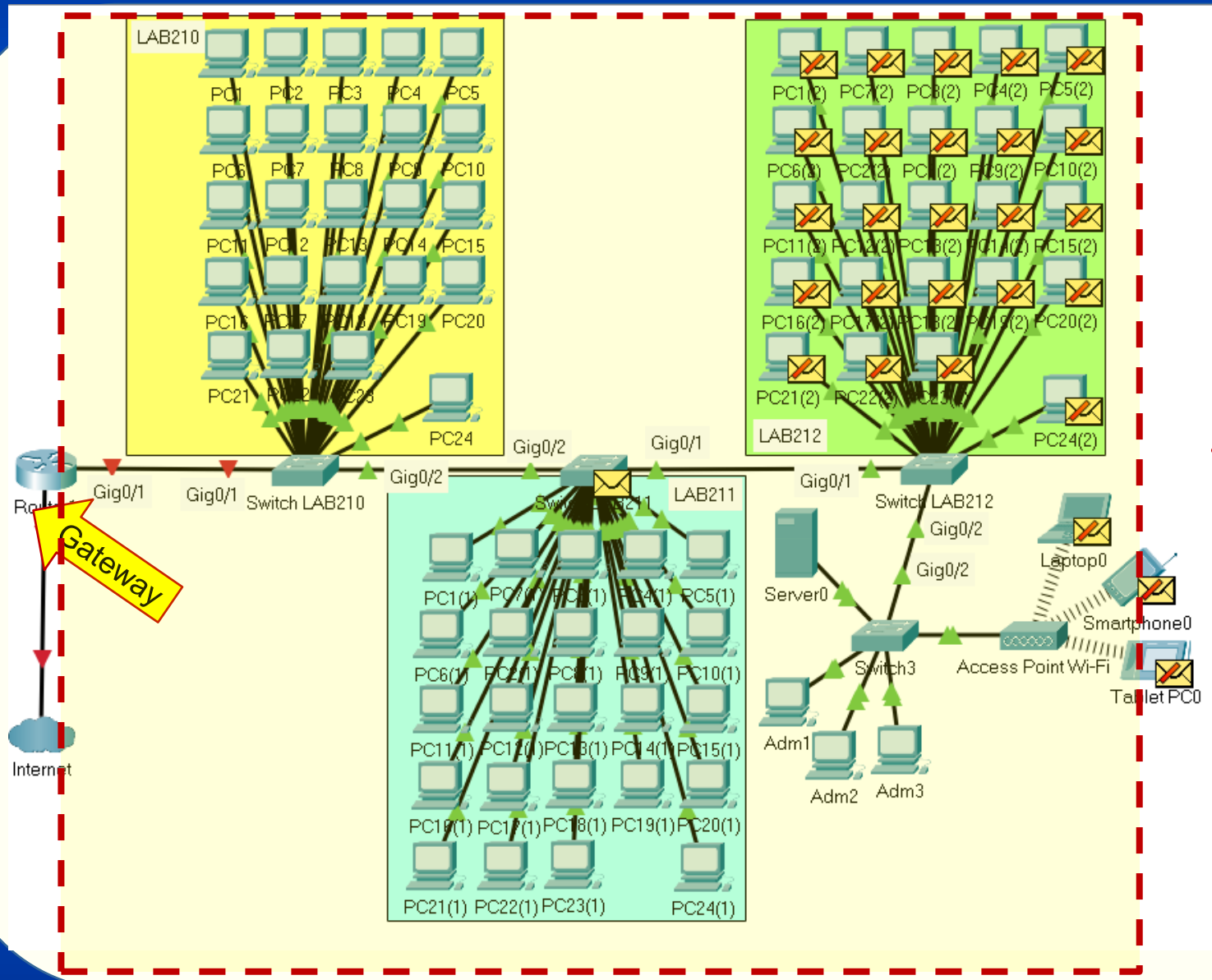
Segurança: Todos os equipamentos conseguem trocar informações uns com os outros sem uma barreira de proteção (*Firewall*) entre eles.

Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt



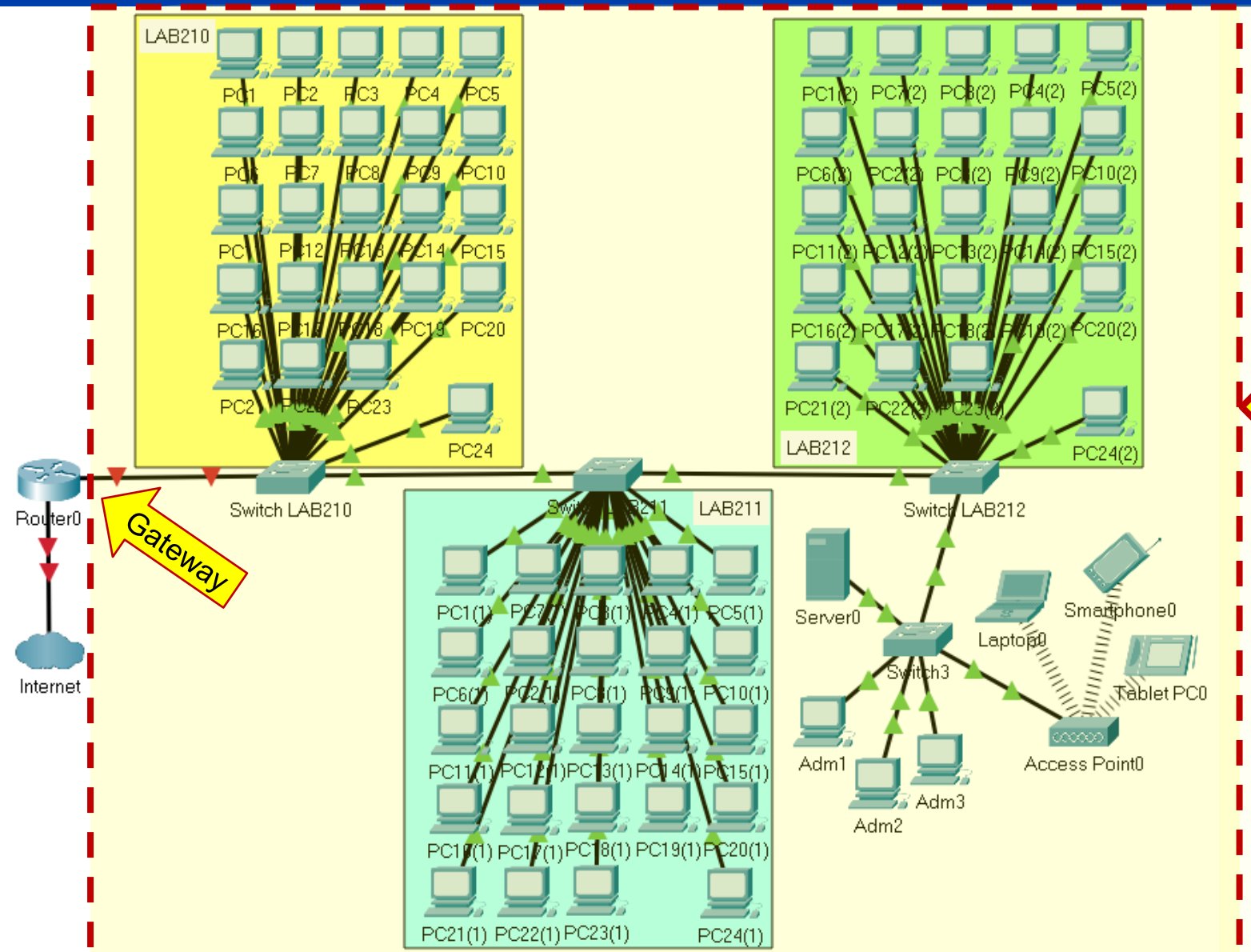


Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt



Broadcasts alcançarão todos os equipamentos da Topologia.
Isso poderá comprometer o desempenho.

Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt



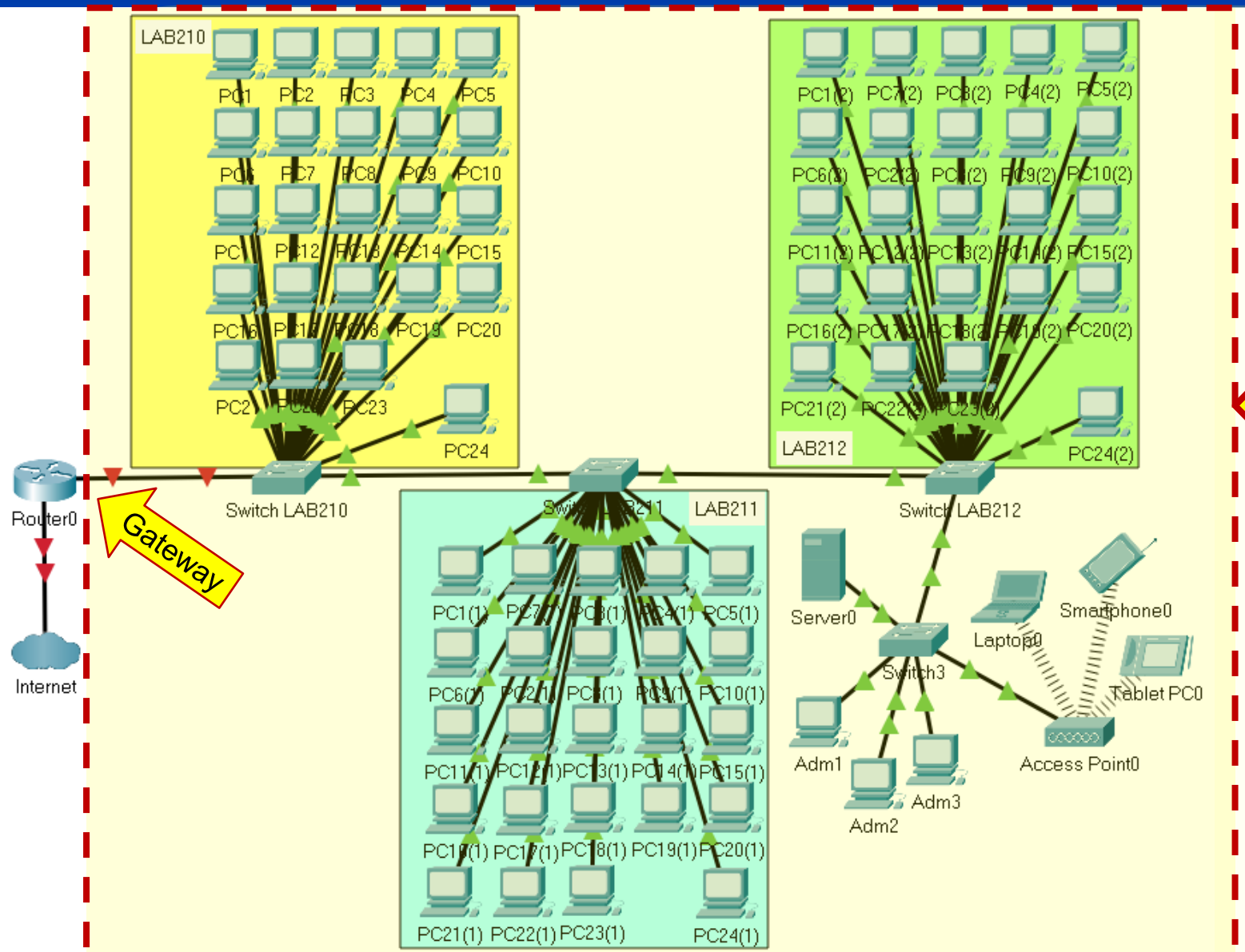
Proposta para divisão em redes Virtuais (VLANs):

- 1 VLAN para cada laboratório: LAB210. LAB211, LAB212
- 1 VLAN para os 3 PCs de professores nos laboratórios
- 1 VLAN para o Servidor
- 1 VLAN para os PCs do Administrativo
- 1 VLAN para a rede Wireless

No total teremos 7 VLANs, ou seja:

- 7 redes
- 7 domínios de broadcast

Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt



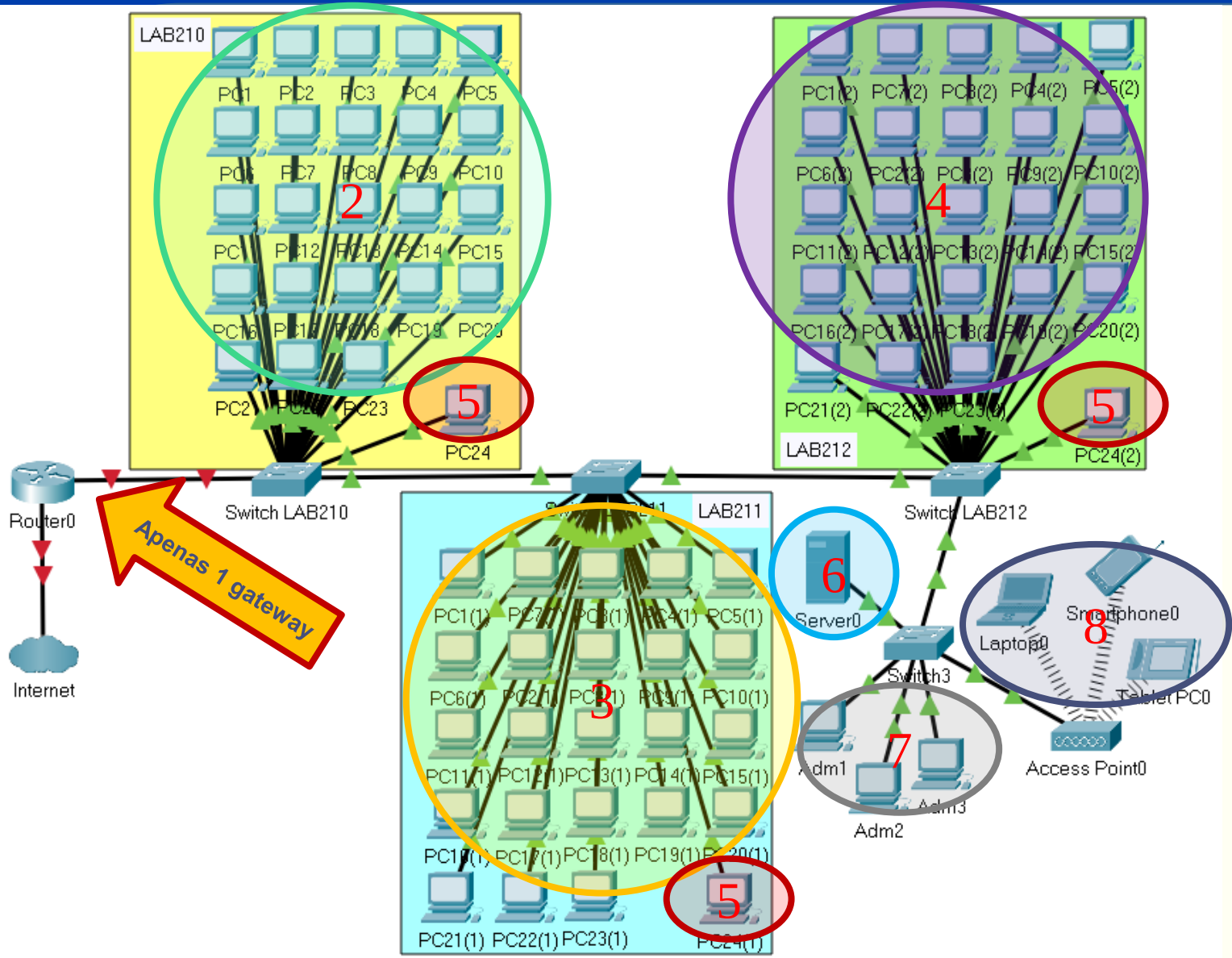
Proposta para divisão em redes Virtuais (VLANs):

- **VLAN1: DEFAULT** (Por padrão, **JÁ EXISTENTE!!!**)
- **VLAN2: LAB210**
- **VLAN3: LAB211**
- **VLAN4: LAB212**
- **VLAN5: PROFE**
- **VLAN6: SERVER**
- **VLAN7: ADM**
- **VLAN8: WIFI**

No total serão configuradas 7 VLANs, ou seja:

- **7 redes**
- **7 domínios de broadcast**

Cenário Proposto: Aula 10 PráticacomSwitcheseVlan 2023.pkt



Proposta para divisão em redes Virtuais (VLANs):

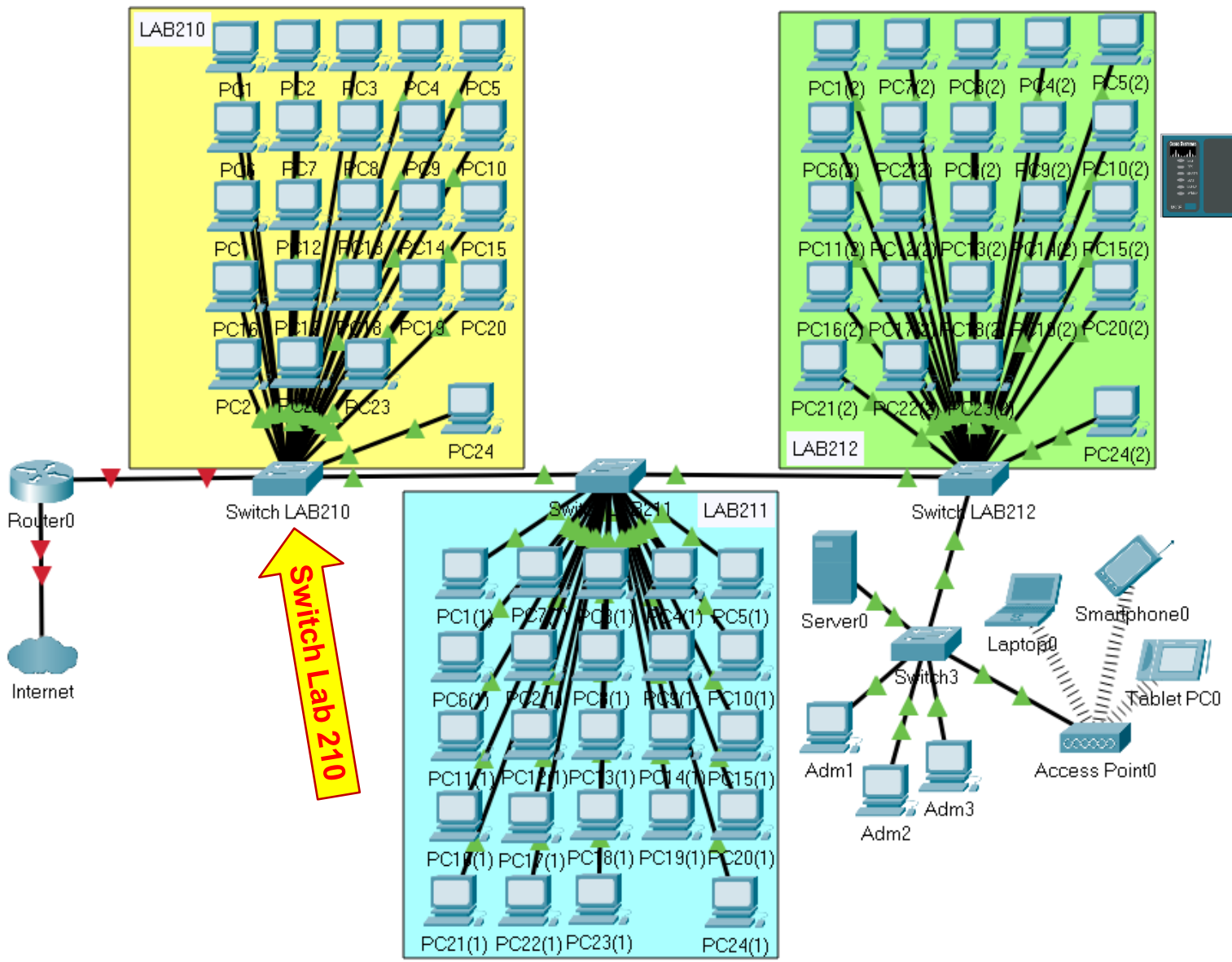
- **VLAN1: DEFAULT** (Por padrão, JÁ EXISTENTE!!!)
- **VLAN2: LAB210**
- **VLAN3: LAB211**
- **VLAN4: LAB212**
- **VLAN5: PROFE**
- **VLAN6: SERVER**
- **VLAN7: ADM**
- **VLAN8: WIFI**
- **Vlan99: Native (VLAN de gerência)**

No total serão configuradas 7 VLANs a divisão em:

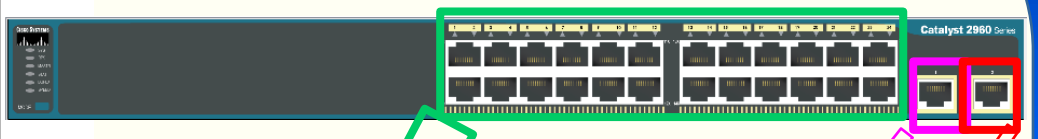
- **7 redes**
- **7 domínios de broadcast**

Switch LAB210

Análise 1: Switch LAB210



Switch LAB210



interface GigaEthernet:

- `Gig0/1` -> Roteador

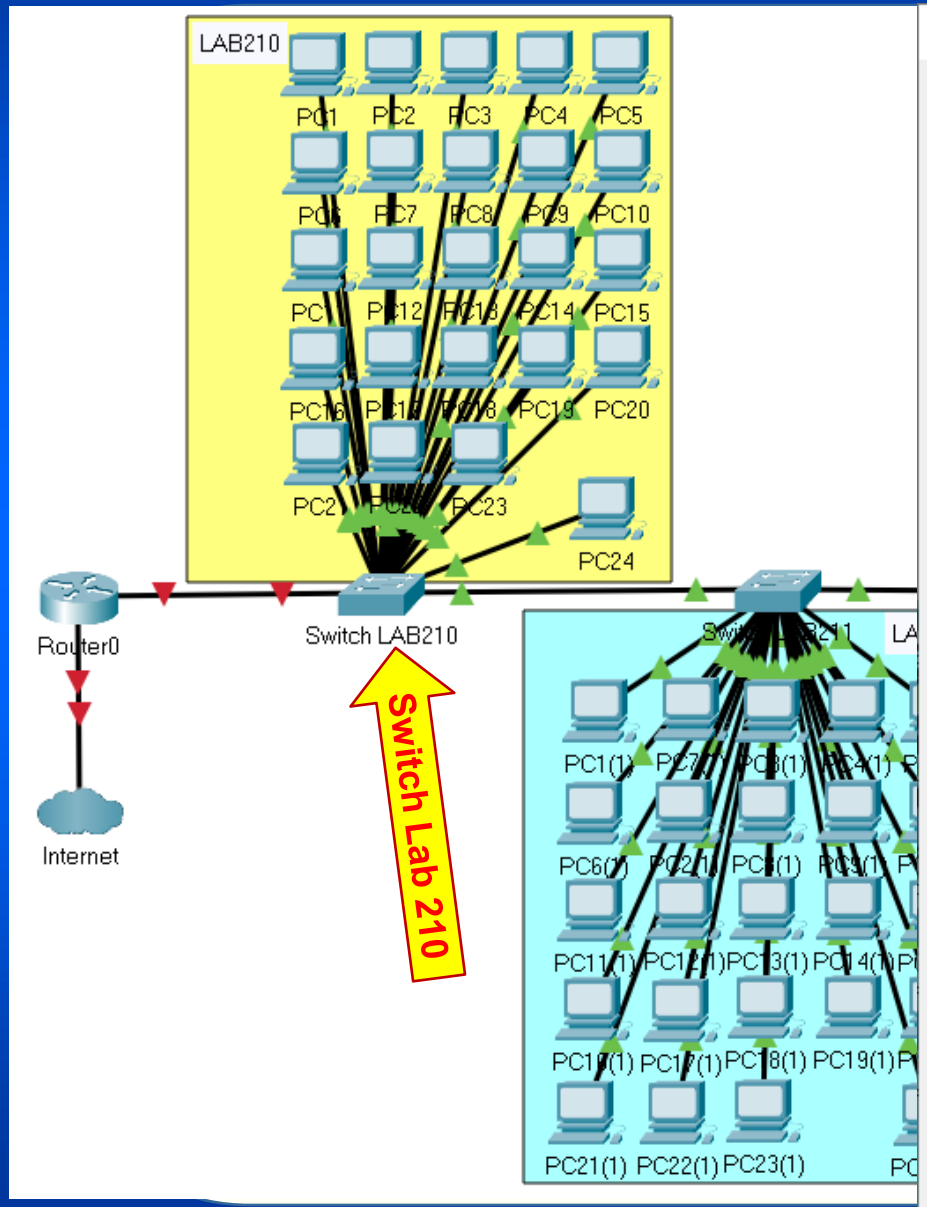
24 interfaces FastEthernet:

- `Fa0/1` -> PC1
- `Fa0/2` -> PC2
- `Fa0/3` -> PC3
- ...
- `Fa0/24` -> PC24

interface GigaEthernet:

- `Gig0/2` -> Switch Lab211

Análise 2: Switch LAB210



Switch LAB210

Switch LAB210

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch>
Switch>enable
Switch#show vlan

VLAN Name                                Status    Ports
---- ----------------------------------- --------- -------------------------------
1    default                             active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                   Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                   Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                   Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                   Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                   Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                   Gig0/1, Gig0/2
1002 fddi-default                        active
1003 token-ring-default                  active
1004 fddinet-default                     active
1005 trnet-default                       active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
---- ----- ---------- ----- ------ ------ -------- ---- -------- ------ ------
1    enet  100001     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
1004 fdnet 101004     1500  -      -      -        ieee -        0      0
1005 trnet 101005     1500  -      -      -        ibm  -        0      0
 --More--
```

Ctrl+F6 to exit CLI focus

Copy | Paste

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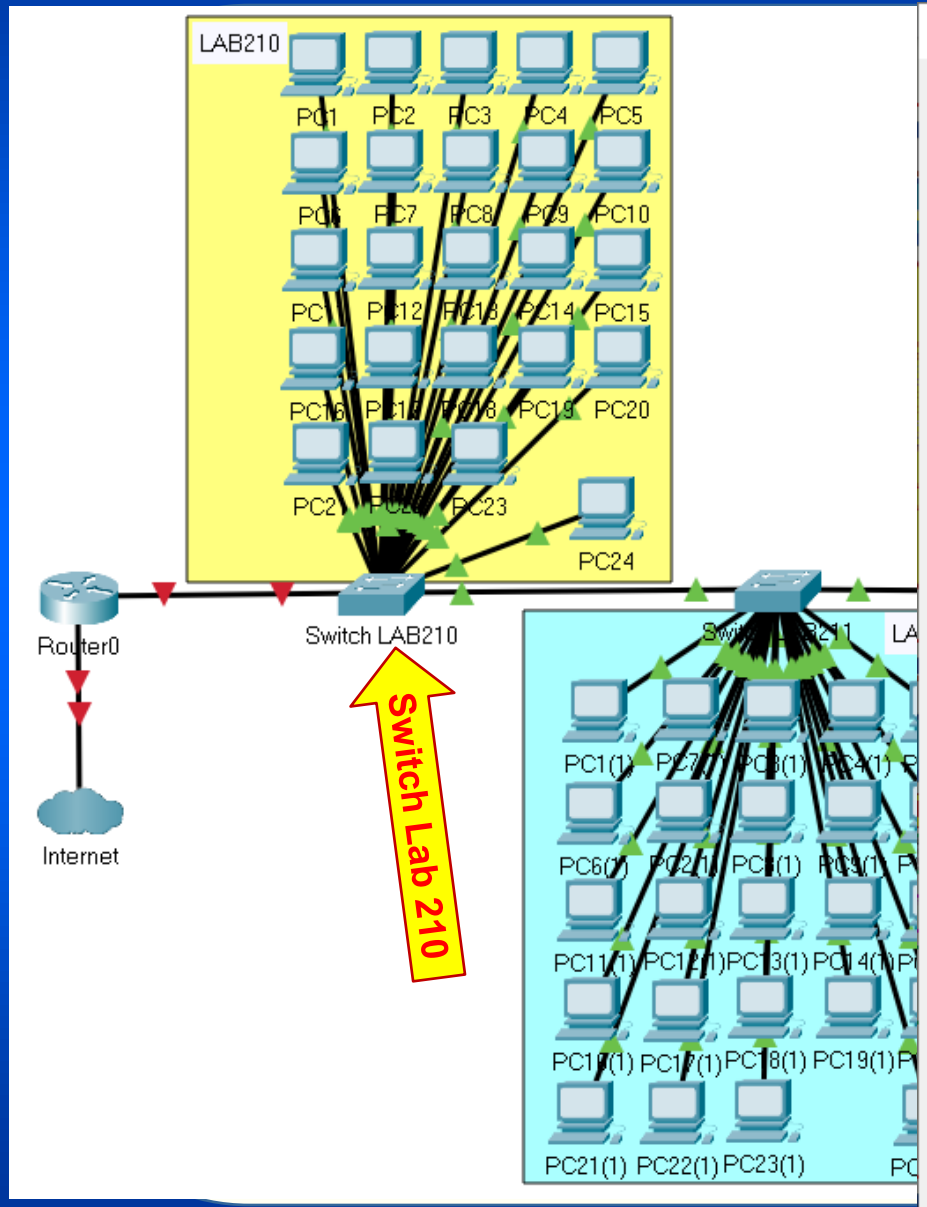
Configuração 1: Configurar VLANs no Switch LAB210



Switch LAB210

Switch LAB210

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch#
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#name lab210
Switch(config-vlan)#
Switch(config-vlan)#vlan 3
Switch(config-vlan)#name lab211
Switch(config-vlan)#
Switch(config-vlan)#vlan 4
Switch(config-vlan)#name lab212
Switch(config-vlan)#
Switch(config-vlan)#vlan 5
Switch(config-vlan)#name profe
Switch(config-vlan)#
Switch(config-vlan)#vlan 6
Switch(config-vlan)#name server
Switch(config-vlan)#
Switch(config-vlan)#vlan 7
Switch(config-vlan)#name ADM
Switch(config-vlan)#
Switch(config-vlan)#vlan 8
Switch(config-vlan)#name wifi
Switch(config-vlan)#
Switch(config-vlan)#vlan 99
Switch(config-vlan)#name native
Switch(config-vlan)#
```

Ctrl+F6 to exit CLI focus

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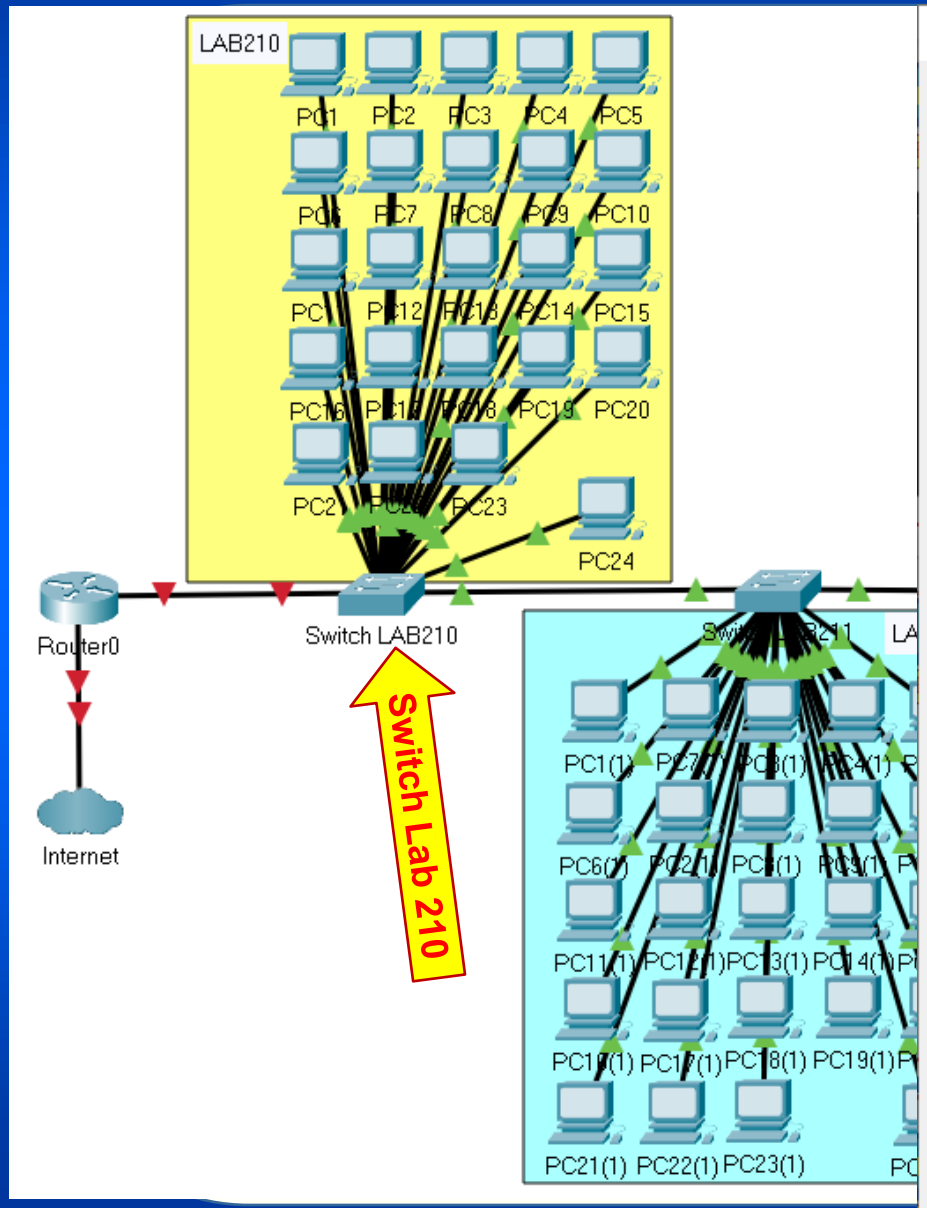
Análise 3: Switch LAB210



Switch LAB210

Switch LAB210

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                 Gig0/1, Gig0/2
2    lab210                            active
3    lab211                            active
4    lab212                            active
5    profe                             active
6    server                            active
7    ADM                               active
8    wifi                              active
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
 --More--
```

Ctrl+F6 to exit CLI focus

Copy | Paste

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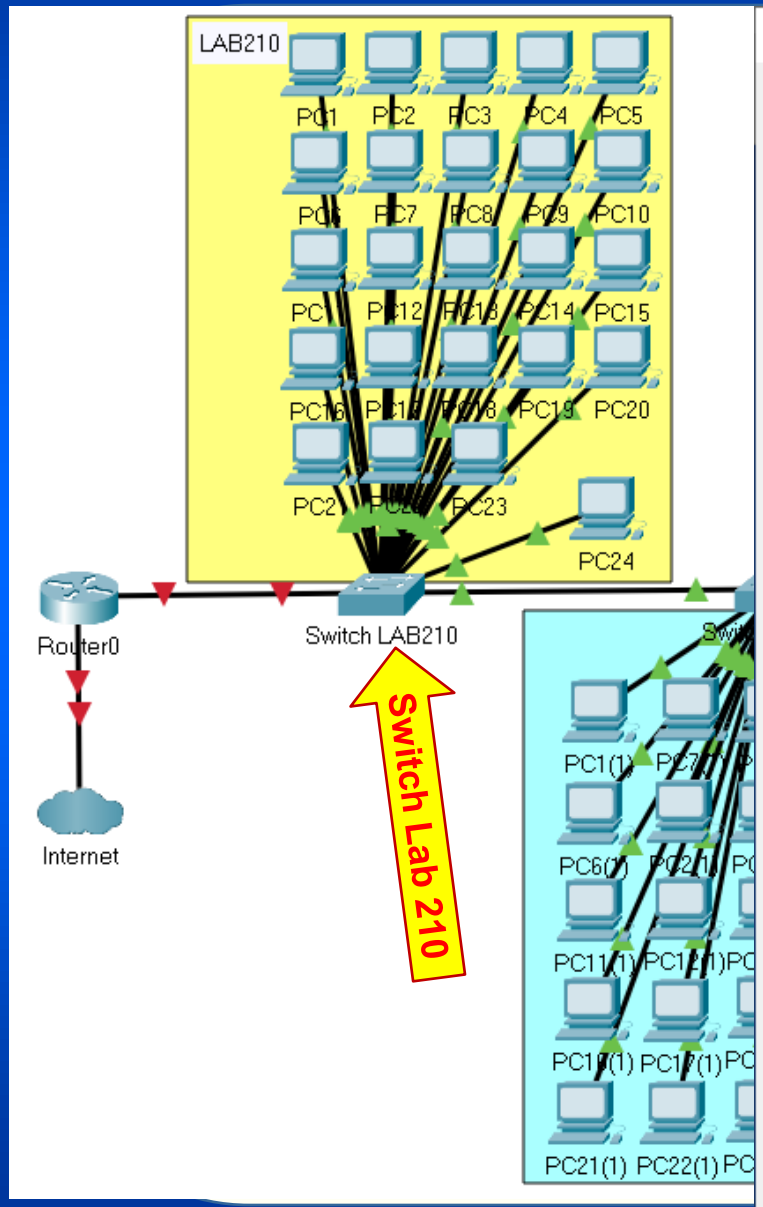
Configuração 2: Configurar interfaces no Switch LAB210



Switch LAB210

Switch LAB210

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch>
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#interface range fa0/1-23
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 2
Switch(config-if-range)#
Switch(config-if-range)#interface fa0/24
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 5
Switch(config-if)#^Z
```

Ctrl+F6 to exit CLI focus

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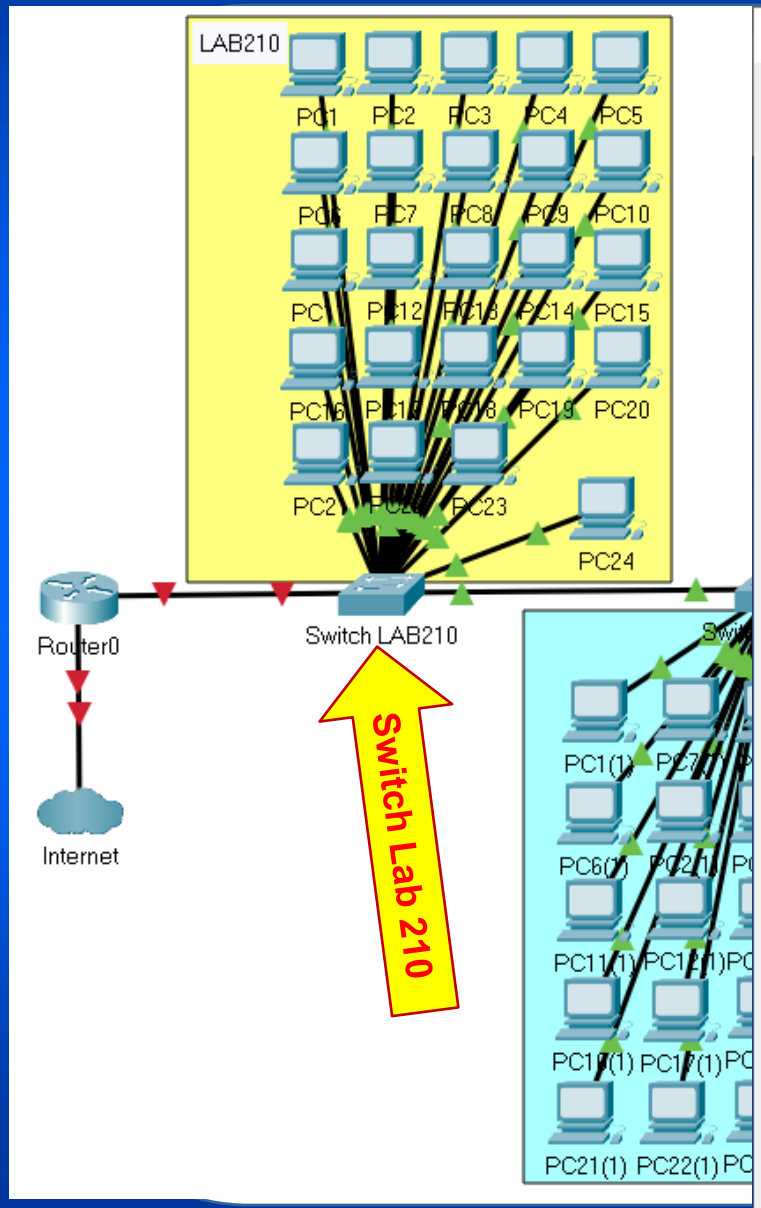
Análise 3: Switch LAB210



Switch LAB210

Switch LAB210

Physical Config CLI Attributes

IOS Command Line Interface

```
%SYS-5-CONFIG_I: Configured from console by console
^Z
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Gig0/1, Gig0/2
2    lab210                            active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23
3    lab211                            active
4    lab212                            active
5    profe                             active    Fa0/24
6    server                            active
7    ADM                               active
8    wifi                              active
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

 --More--
```

Ctrl+F6 to exit CLI focus

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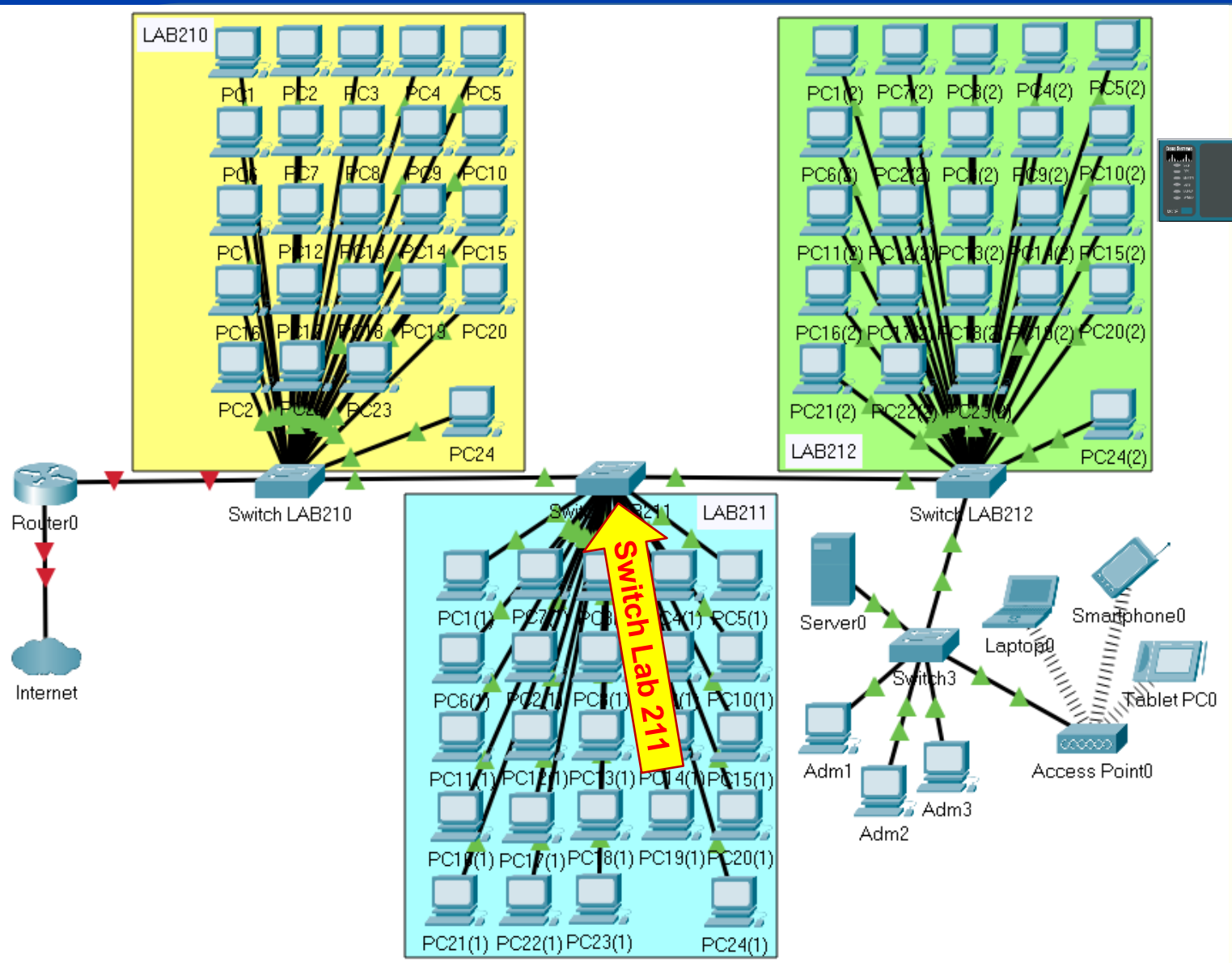
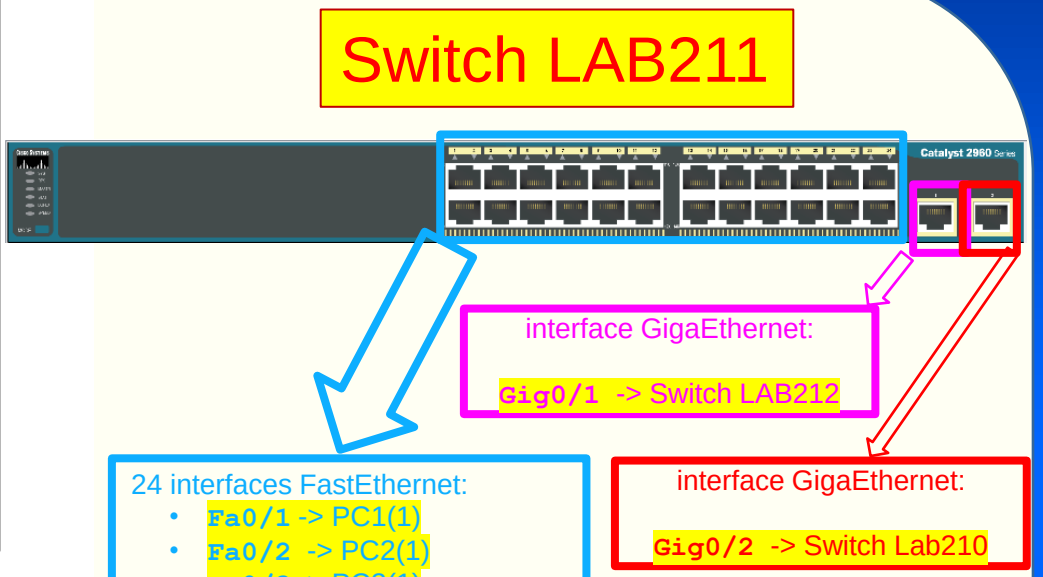
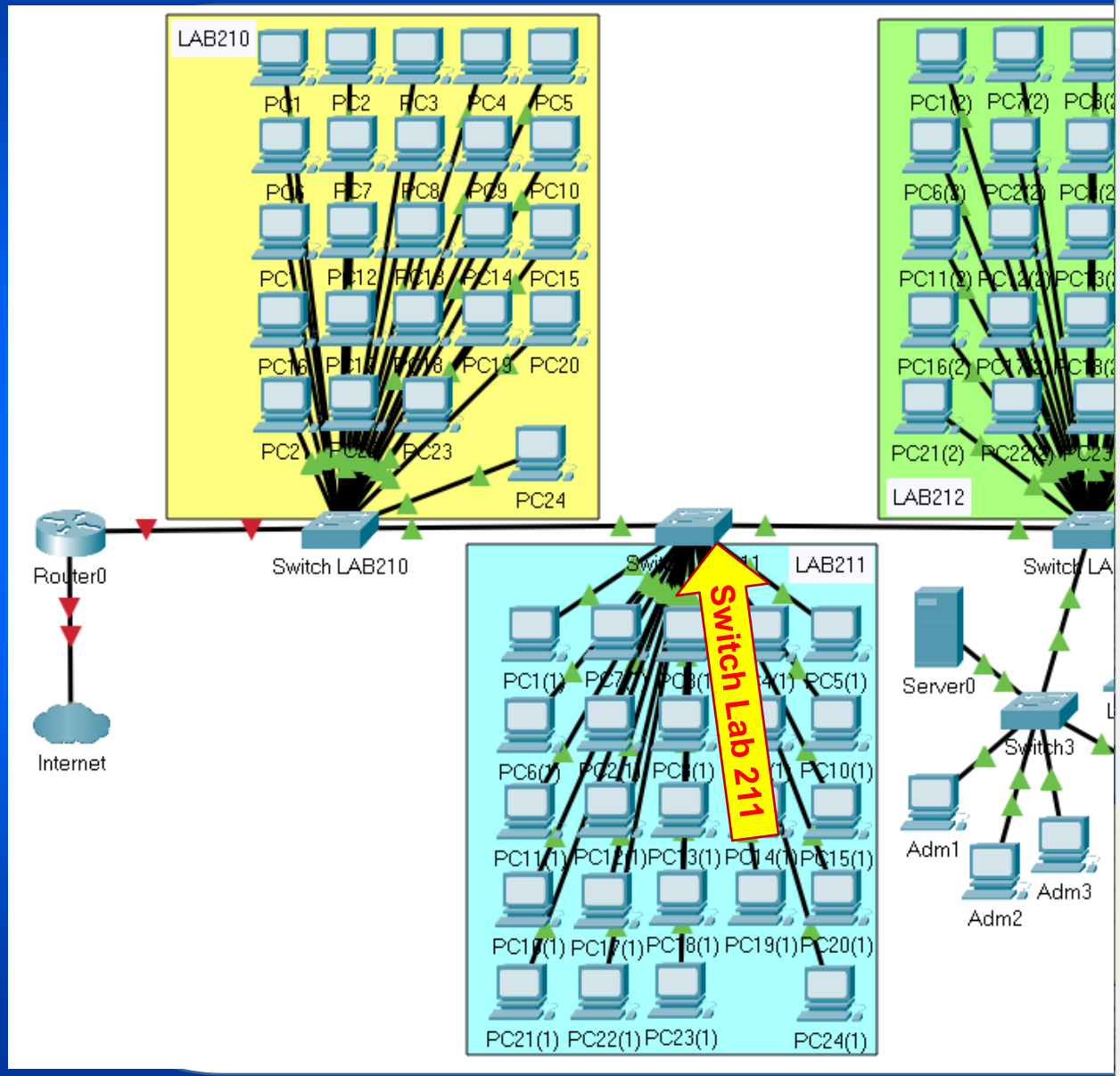
Switch LAB211

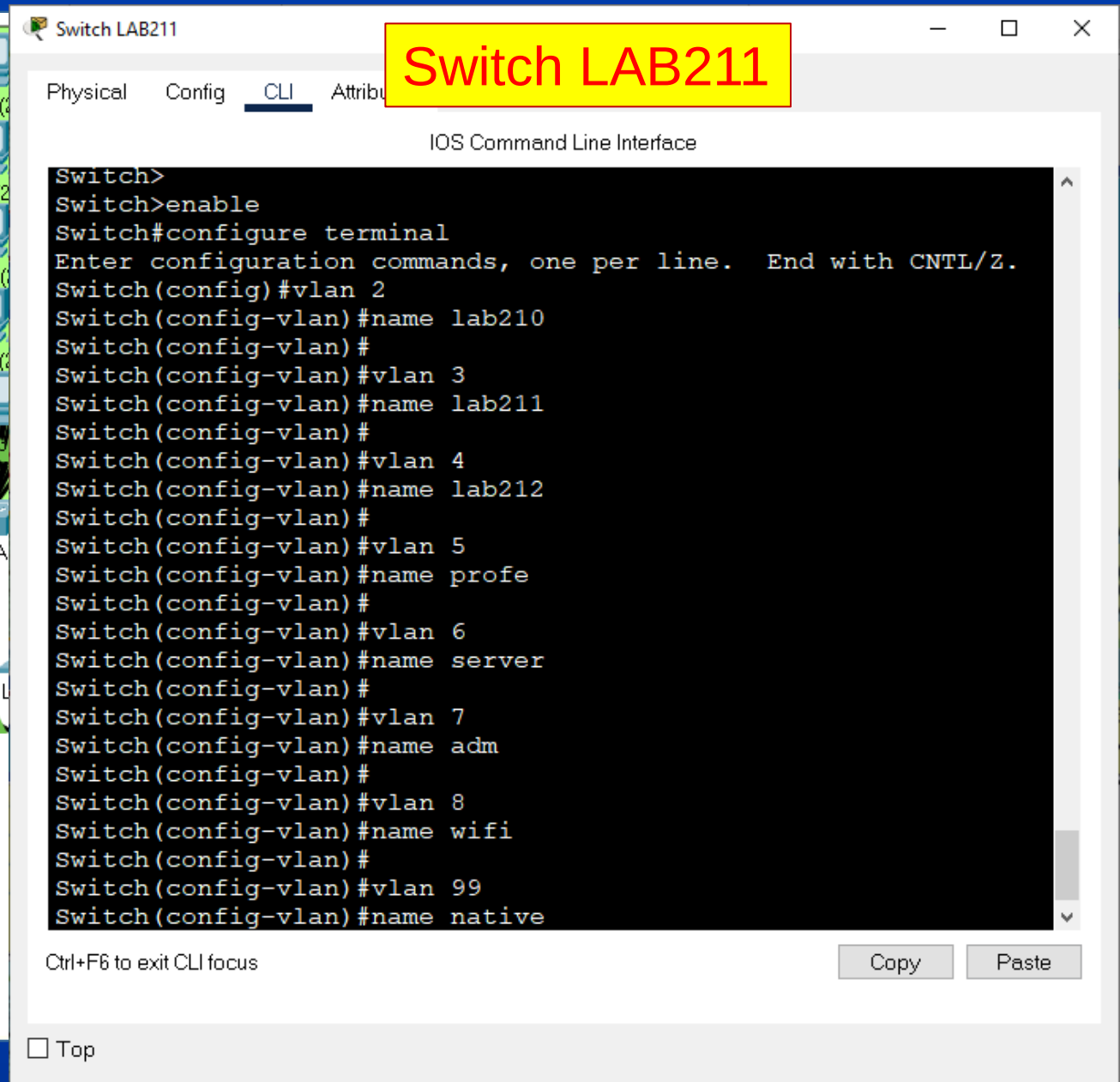
Análise 1: Switch LAB211



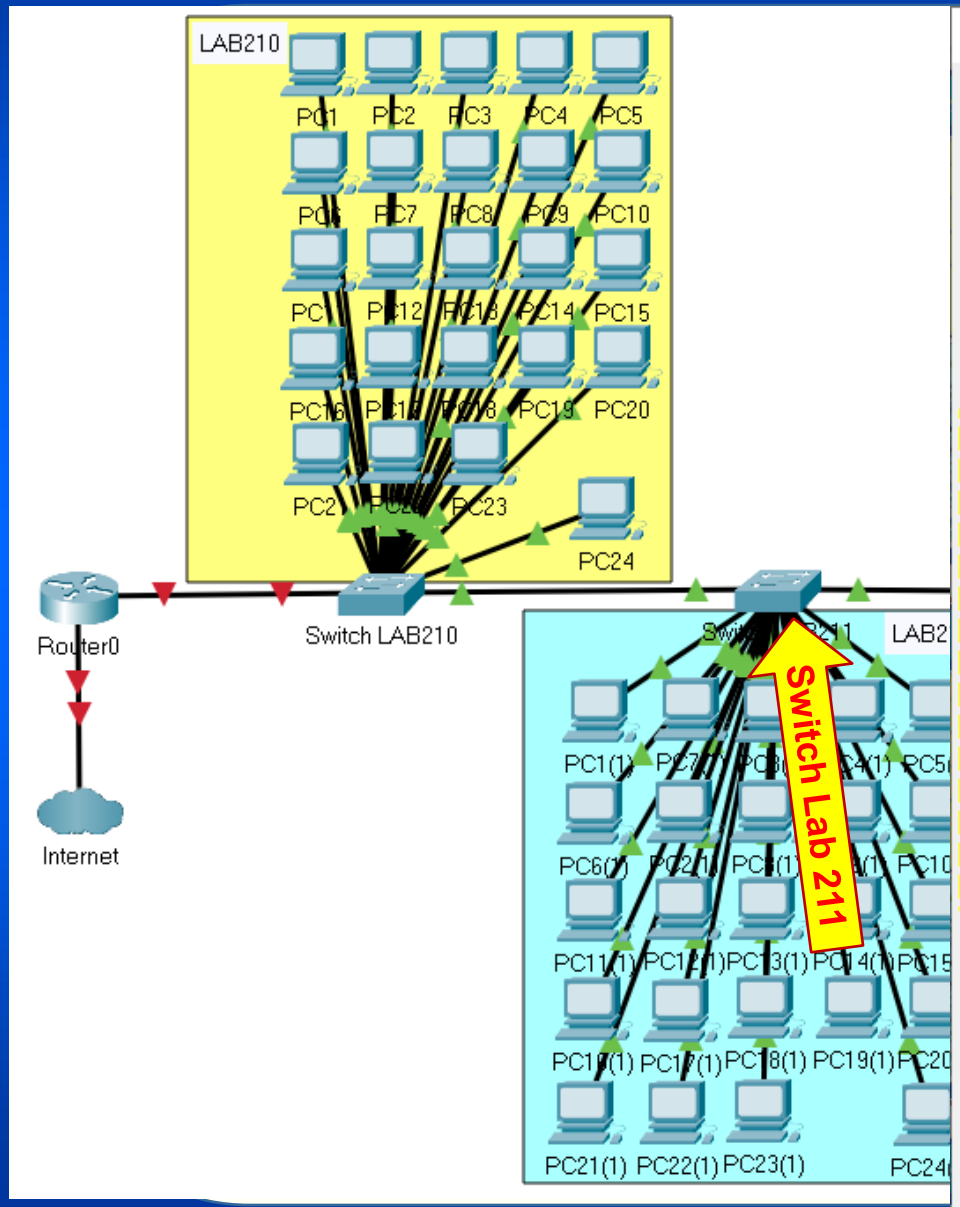


Configuração 2: Configurar VLANs no Switch LAB211





Análise 2: Switch LAB211



Switch LAB211

Switch LAB211

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch#
Switch#
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                 Gig0/1, Gig0/2
2    lab210                            active
3    lab211                            active
4    lab212                            active
5    profe                             active
6    server                            active
7    adm                               active
8    wifi                              active
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
 --More--
```

Ctrl+F6 to exit CLI focus

Copy | Paste

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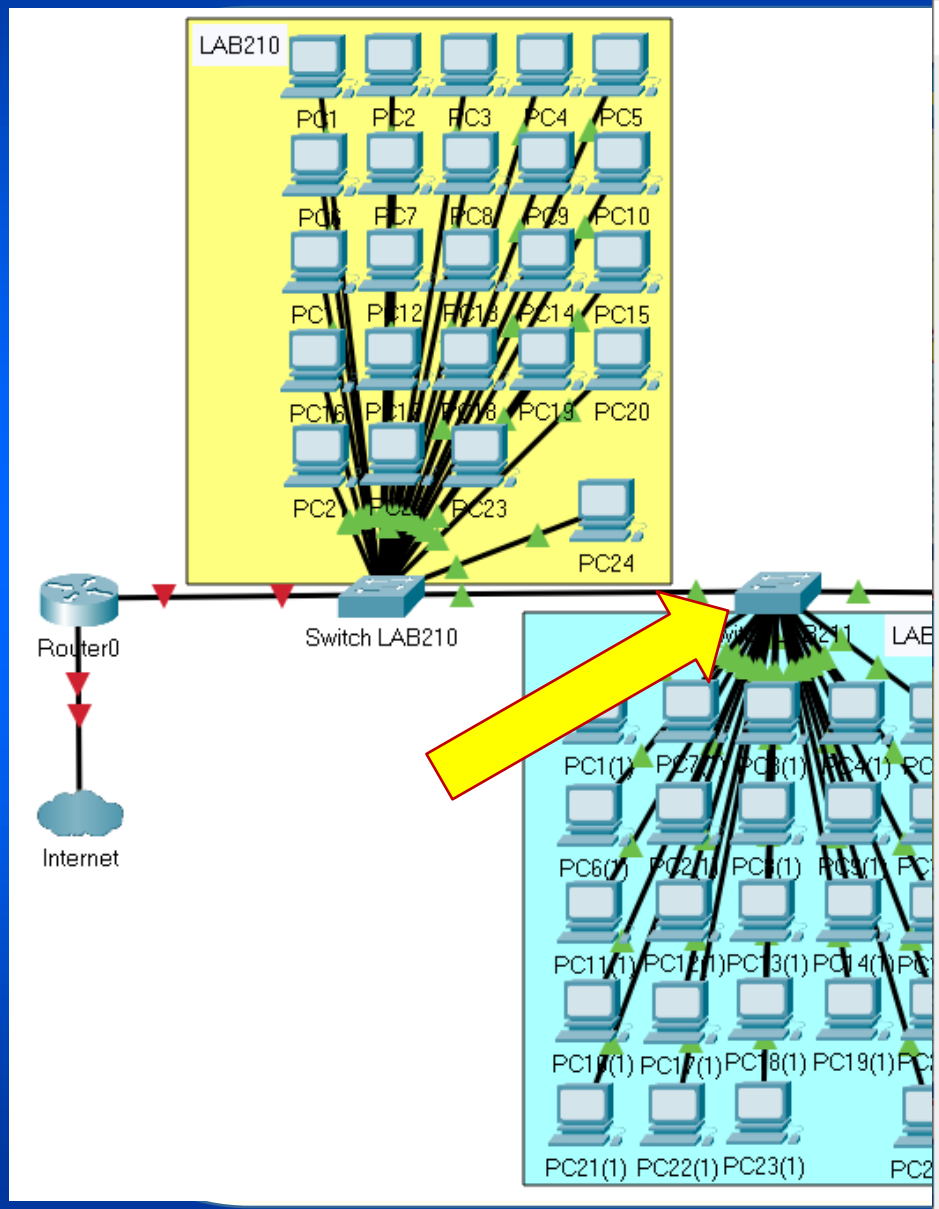
Configuração 2: Configurar interfaces no Switch LAB211



Switch LAB211

Switch LAB211

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Press RETURN to get started.



Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#interface range fa0/1-23
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 3
Switch(config-if-range)#
Switch(config-if-range)#interface fa0/24
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 5
Switch(config-if)#
```

Ctrl+F6 to exit CLI focus

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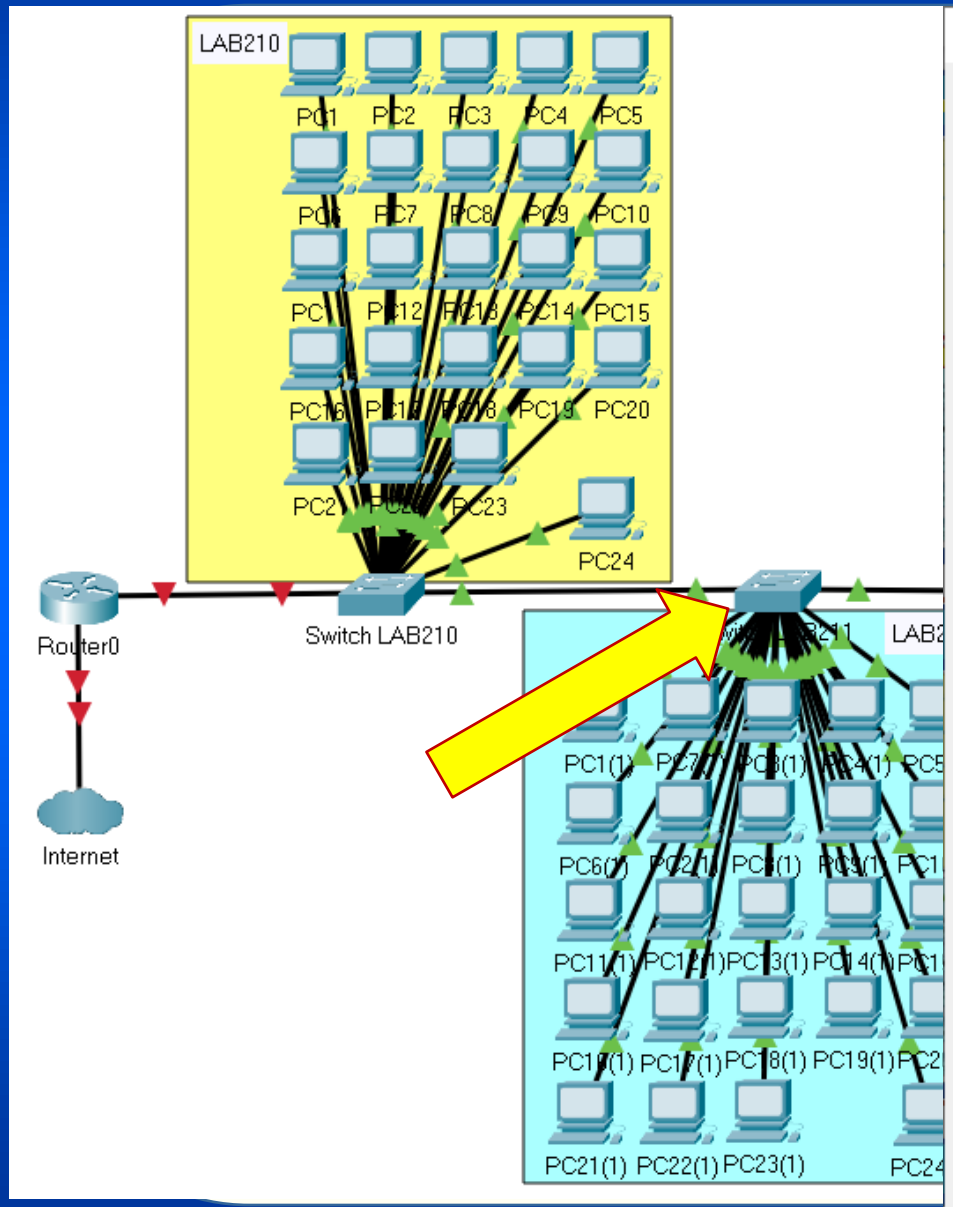
Análise 3: Switch LAB211



Switch LAB211

Switch LAB211

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch#
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Gig0/1, Gig0/2
2    lab210                            active
3    lab211                            active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                  Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                  Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                  Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                  Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                  Fa0/21, Fa0/22, Fa0/23
4    lab212                            active
5    profe                             active    Fa0/24
6    server                            active
7    adm                               active
8    wifi                              active
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

 --More--
```

Ctrl+F6 to exit CLI focus

Copy | Paste

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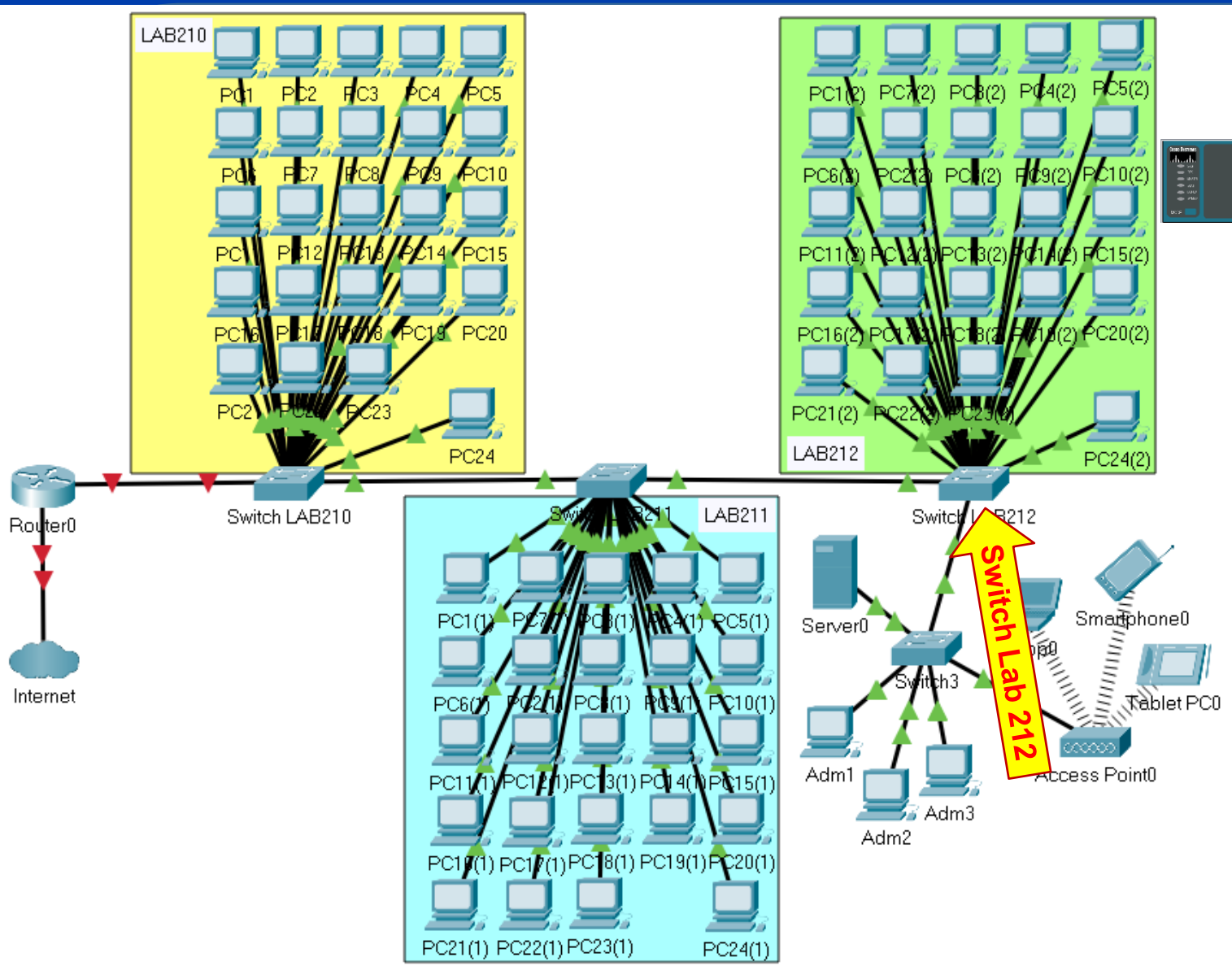
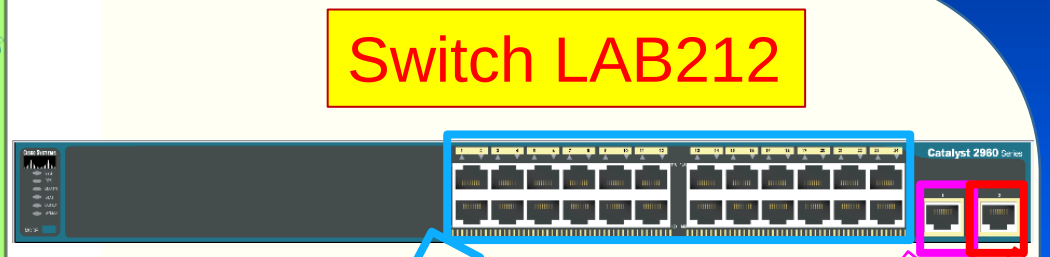
Switch LAB212

Análise 1: Switch LAB212





interface GigaEthernet:

`Gig0/1` -> Switch LAB211

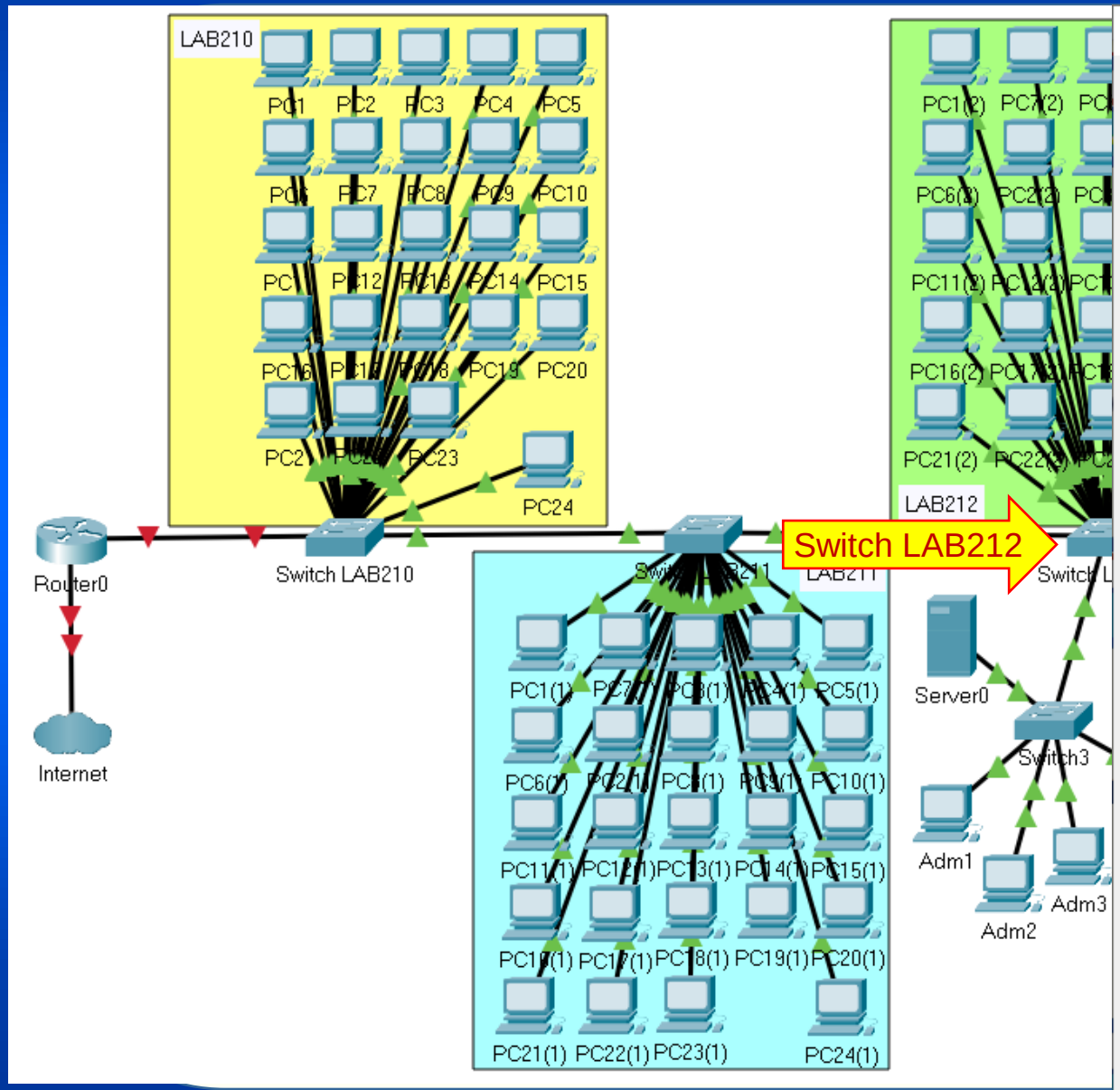
24 interfaces FastEthernet:

- `Fa0/1` -> PC1(2)
- `Fa0/2` -> PC2(2)
- `Fa0/3` -> PC3(2)
- ...
- `Fa0/24` -> PC24(2)

interface GigaEthernet:

`Gig0/2` -> Switch3

Configuração 3: Configurar VLANs no Switch LAB212



Switch LAB212

Switch LAB212

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#vlan 2
Switch(config-vlan)#name lab210
Switch(config-vlan)#
Switch(config-vlan)#vlan 3
Switch(config-vlan)#name lab211
Switch(config-vlan)#
Switch(config-vlan)#vlan 4
Switch(config-vlan)#name lab212
Switch(config-vlan)#
Switch(config-vlan)#vlan 5
Switch(config-vlan)#name profe
Switch(config-vlan)#
Switch(config-vlan)#vlan 6
Switch(config-vlan)#name server
Switch(config-vlan)#
Switch(config-vlan)#vlan 7
Switch(config-vlan)#name ADM
Switch(config-vlan)#
Switch(config-vlan)#vlan 8
Switch(config-vlan)#name wifi
Switch(config-vlan)#
Switch(config-vlan)#vlan 99
Switch(config-vlan)#name native
```

Ctrl+F6 to exit CLI focus

Copy | Paste

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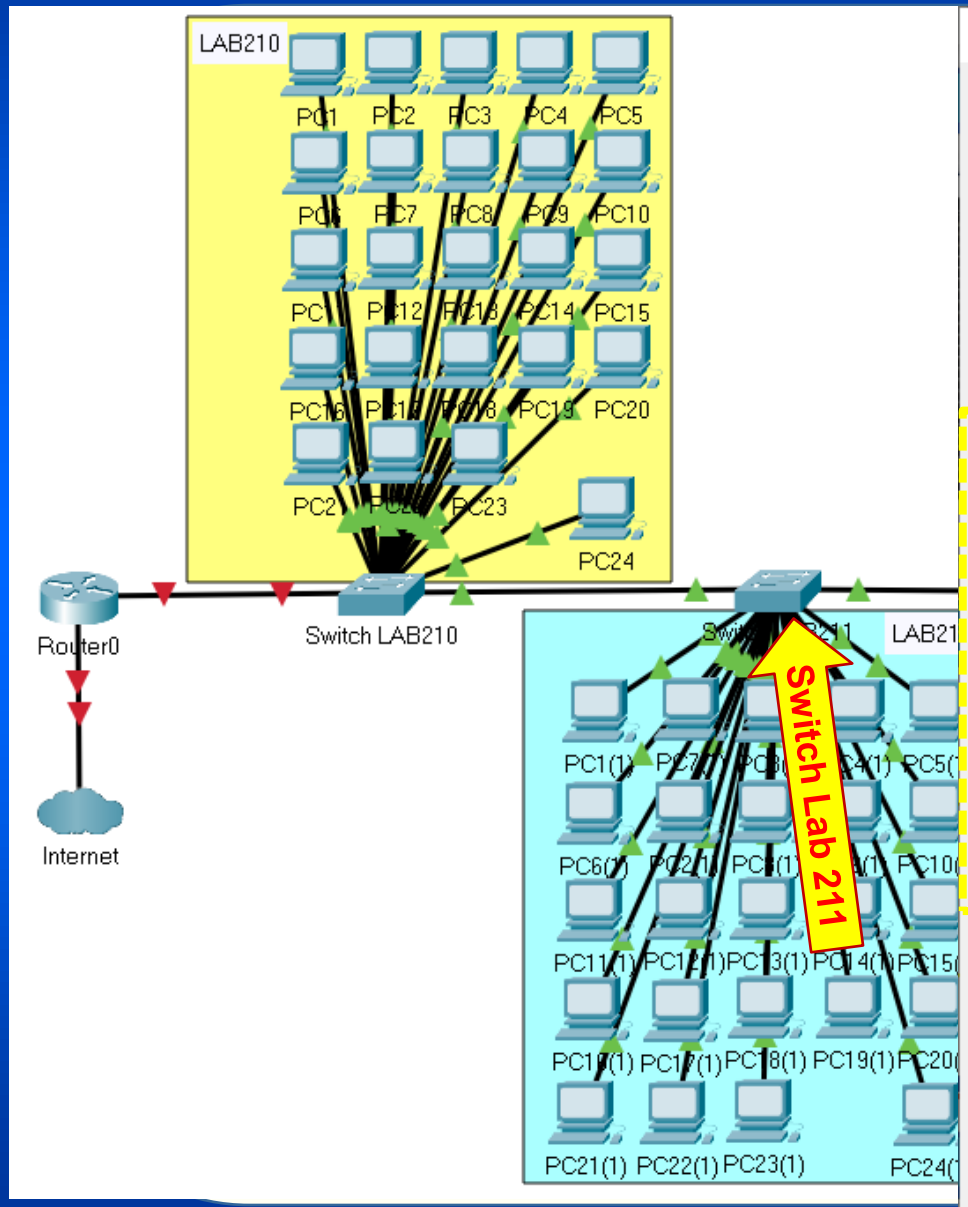
Análise 2: Switch LAB212



Switch LAB212

Switch LAB212

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
%SYS-5-CONFIG_I: Configured from console by console

Switch#
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                 Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                 Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                 Gig0/1, Gig0/2
2    lab210                            active
3    lab211                            active
4    lab212                            active
5    profe                             active
6    server                            active
7    ADM                               active
8    wifi                              active
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active
 --More--
```

Ctrl+F6 to exit CLI focus

Copy | Paste

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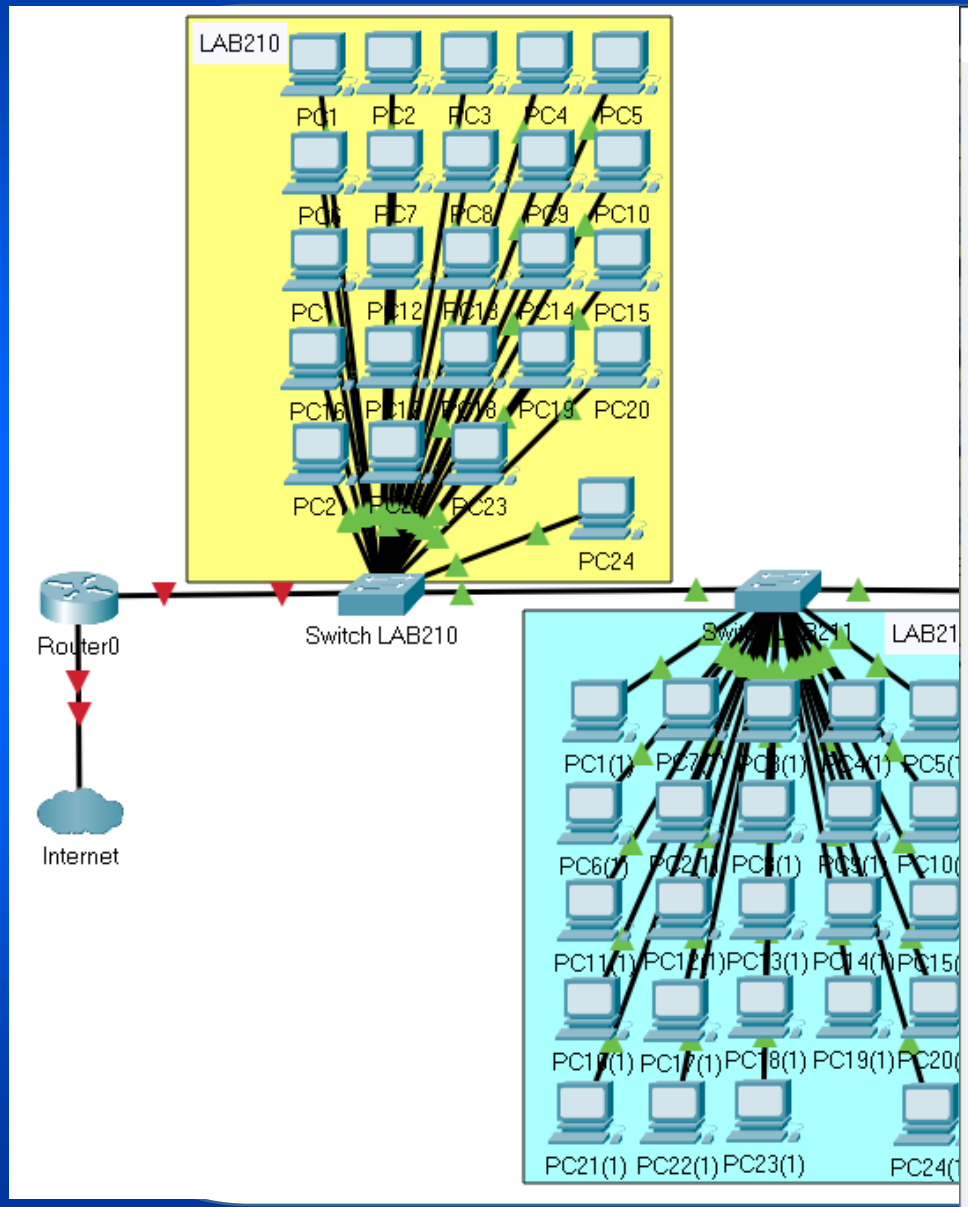
Configuração 2: Configurar interfaces no Switch LAB212



Switch LAB212

Switch LAB212

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch>
Switch>
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#interface range fa0/1-23
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 4
Switch(config-if-range)#
Switch(config-if-range)#interface fa0/24
Switch(config-if)#switchport mode access
Switch(config-if)#swithcport access vlan 5
                  ^
% Invalid input detected at '^' marker.

Switch(config-if)#switchport access vlan 5
Switch(config-if)#
```

Ctrl+F6 to exit CLI focus

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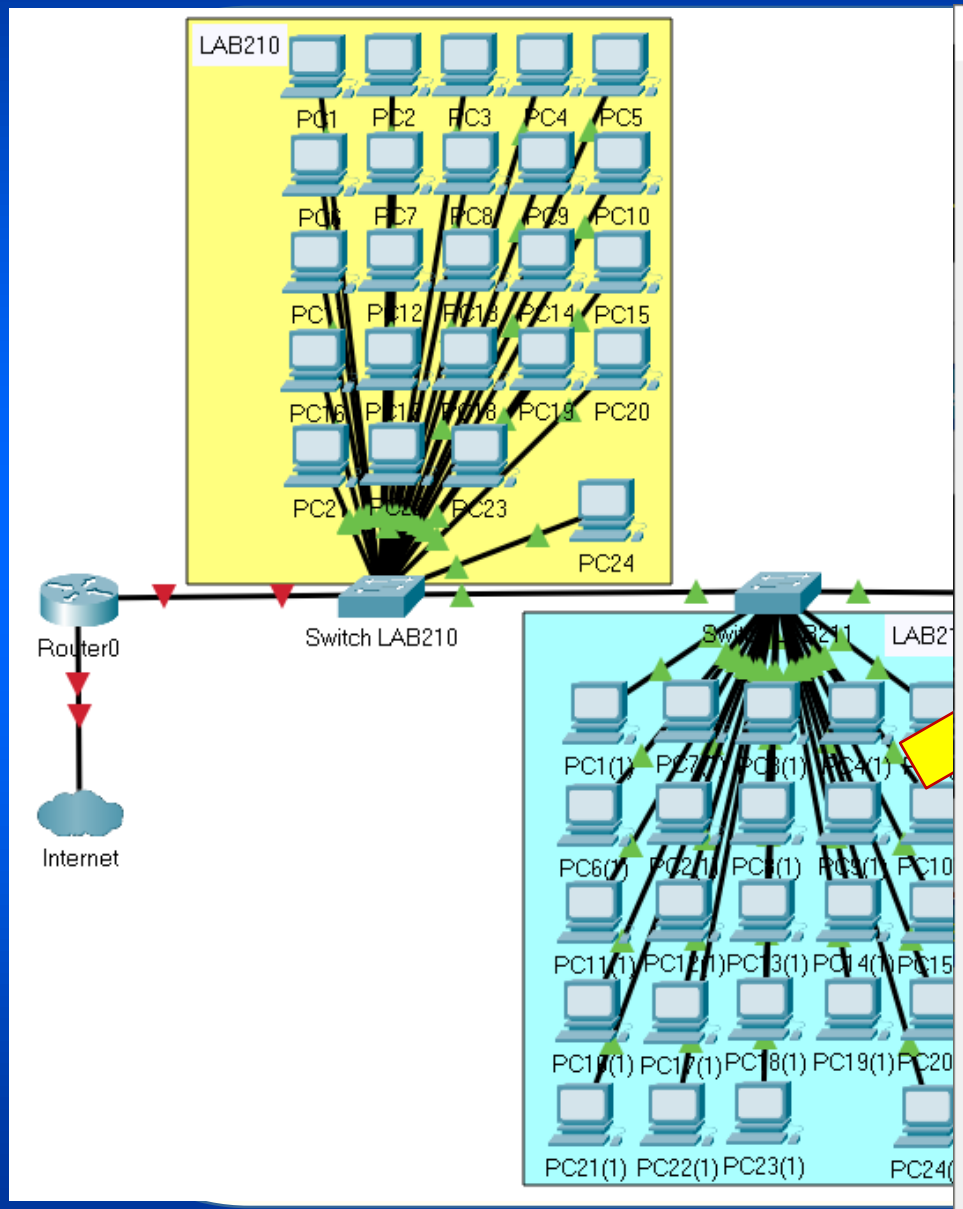
Análise 3: Switch LAB212



Switch LAB212

Switch LAB212

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch#
Switch#
Switch#
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Gig0/1, Gig0/2
2    lab210                            active
3    lab211                            active
4    lab212                            active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                  Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                  Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                  Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                  Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                  Fa0/21, Fa0/22, Fa0/23
5    profe                             active    Fa0/24
6    server                            active
7    ADM                               active
8    wifi                              active
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

 --More--
```

Ctrl+F6 to exit CLI focus

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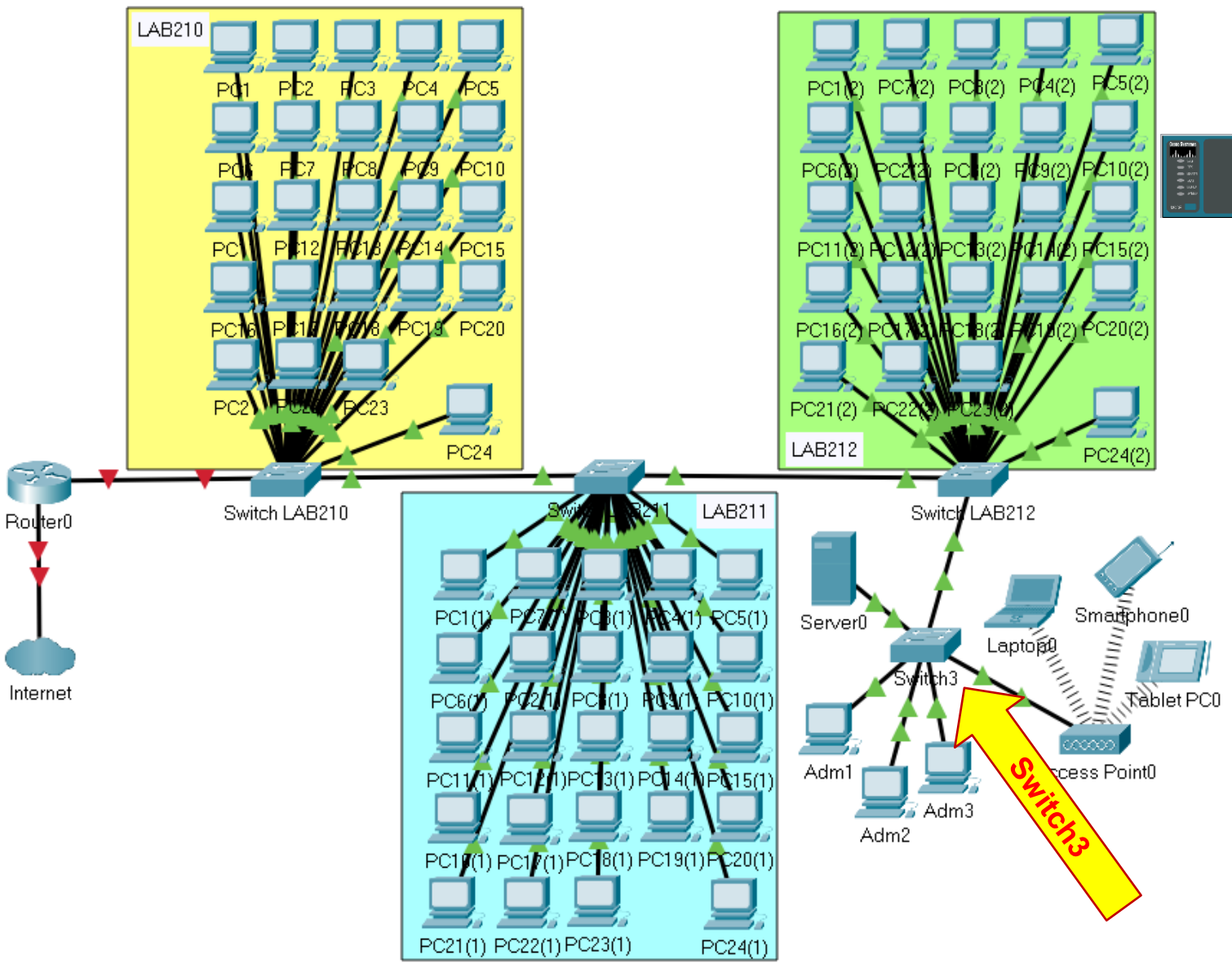
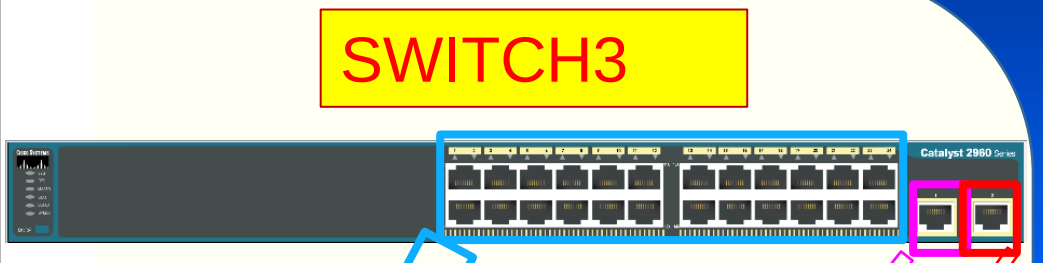
Top

Switch
SWITCH3

Análise 1: Switch Switch3





interface GigaEthernet:

`Gig0/2` -> Switch LAB212

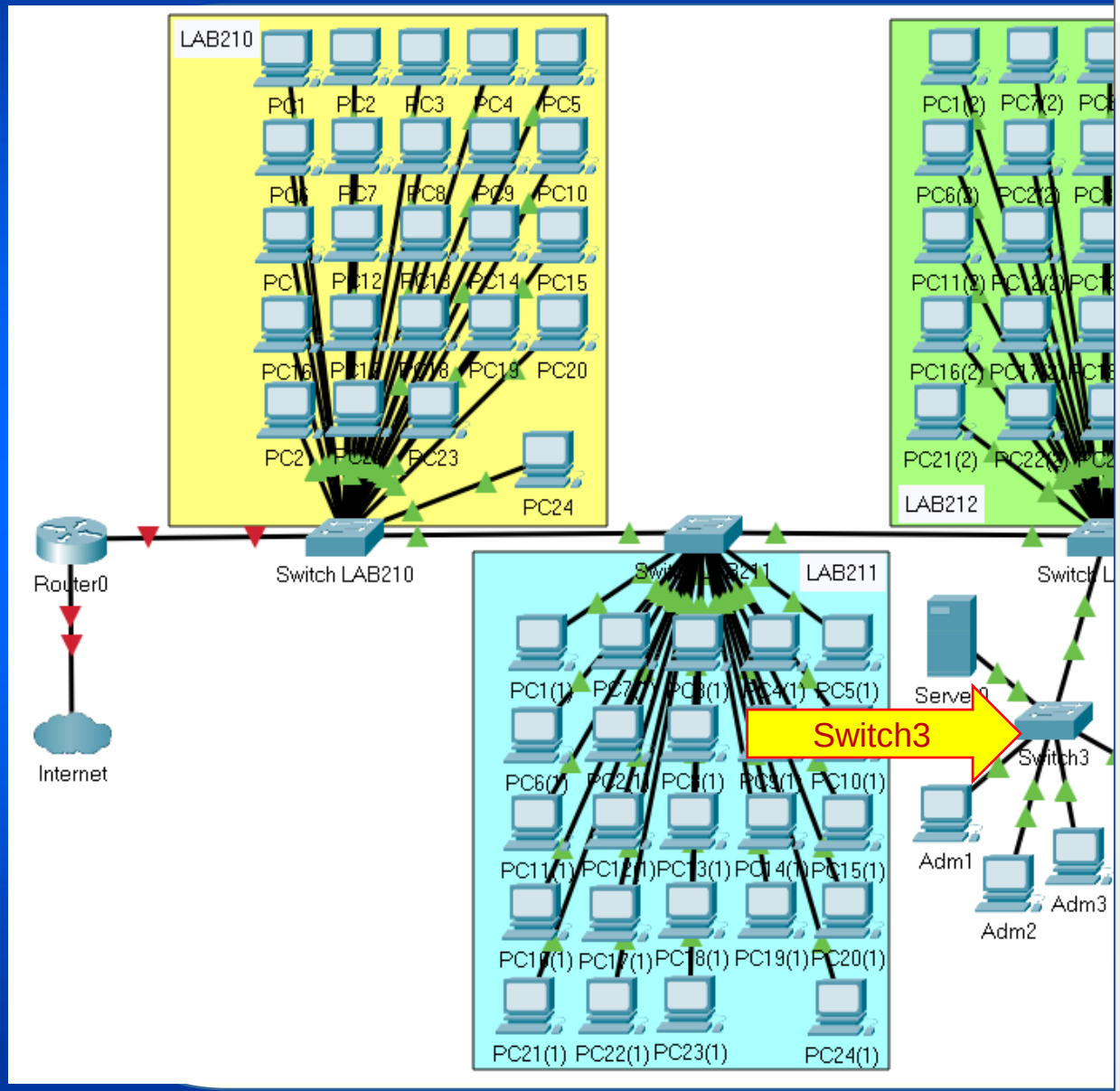
24 interfaces FastEthernet:

- `Fa0/1` -> ADM1
- `Fa0/2` -> ADM2
- `Fa0/3` -> ADM3
- ...
- `Fa0/11` -> Acccess-Point

interface GigaEthernet:

`Gig0/1` -> SERVER

Configuração 1: Configurar VLANs no Switch Switch3



Switch3

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#
Switch(config)#vlan 2
Switch(config-vlan)#name lab210
Switch(config-vlan)#
Switch(config-vlan)#vlan 3
Switch(config-vlan)#name lab211
Switch(config-vlan)#
Switch(config-vlan)#vlan 4
Switch(config-vlan)#name lab212
Switch(config-vlan)#
Switch(config-vlan)#vlan 5
Switch(config-vlan)#name profe
Switch(config-vlan)#
Switch(config-vlan)#vlan 6
Switch(config-vlan)#name server
Switch(config-vlan)#
Switch(config-vlan)#vlan 7
Switch(config-vlan)#name adm
Switch(config-vlan)#
Switch(config-vlan)#vlan 8
Switch(config-vlan)#name wifi
Switch(config-vlan)#
Switch(config-vlan)#vlan 99
Switch(config-vlan)#name native
```

Ctrl+F6 to exit CLI focus

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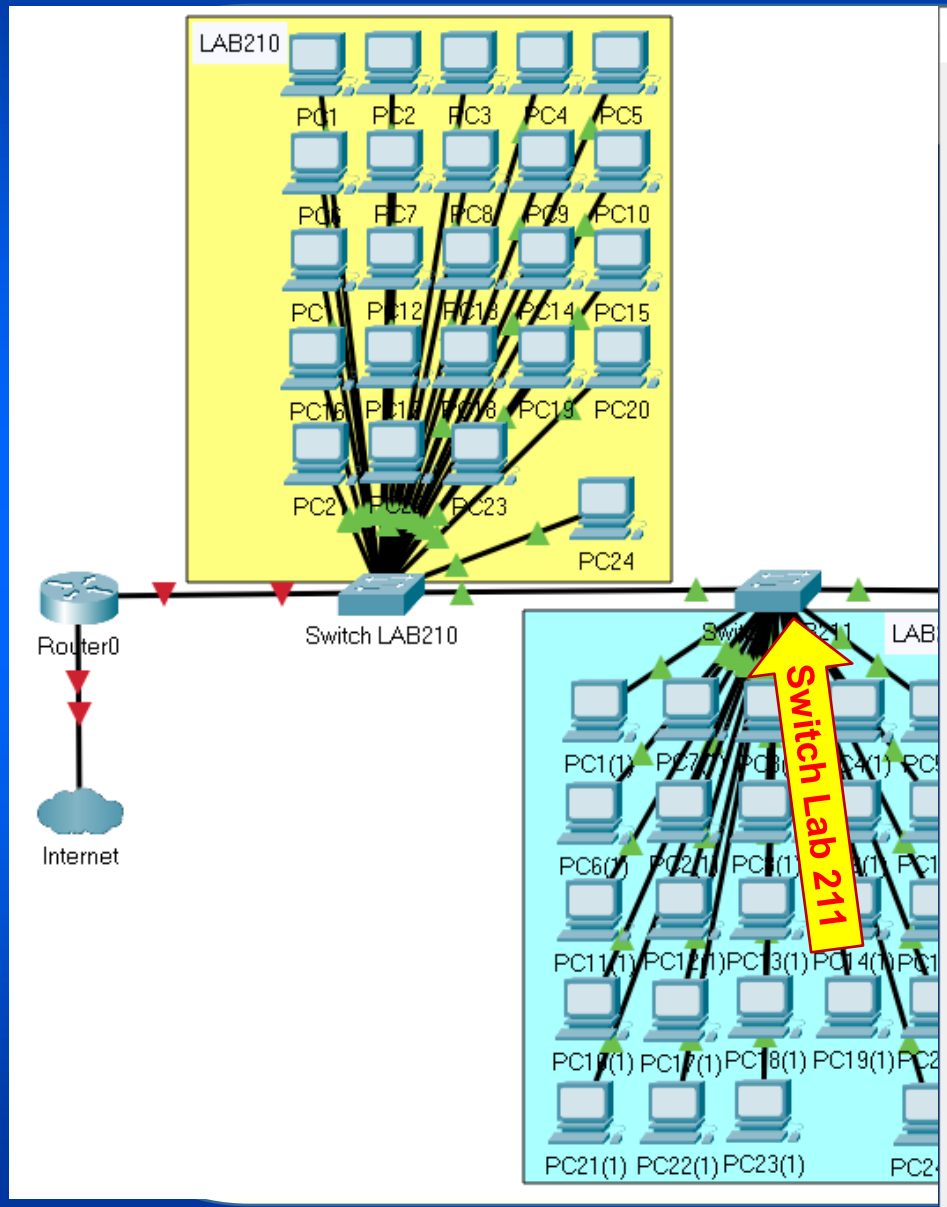
Análise 2: Switch Switch3



Switch3

Switch3

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
%SYS-5-CONFIG_I: Configured from console by console

Switch#
Switch#show vlan

VLAN Name                                Status    Ports
---- ----------------------------------- --------- -------------------------------
1    default                             active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                   Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                                   Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                                   Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                   Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                   Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                                   Gig0/1, Gig0/2
2    lab210                              active
3    lab211                              active
4    lab212                              active
5    profe                               active
6    server                              active
7    adm                                 active
8    wifi                                active
99   native                              active
1002 fddi-default                        active
1003 token-ring-default                  active
1004 fddinet-default                     active
1005 trnet-default                       active
 --More--
```

Ctrl+F6 to exit CLI focus

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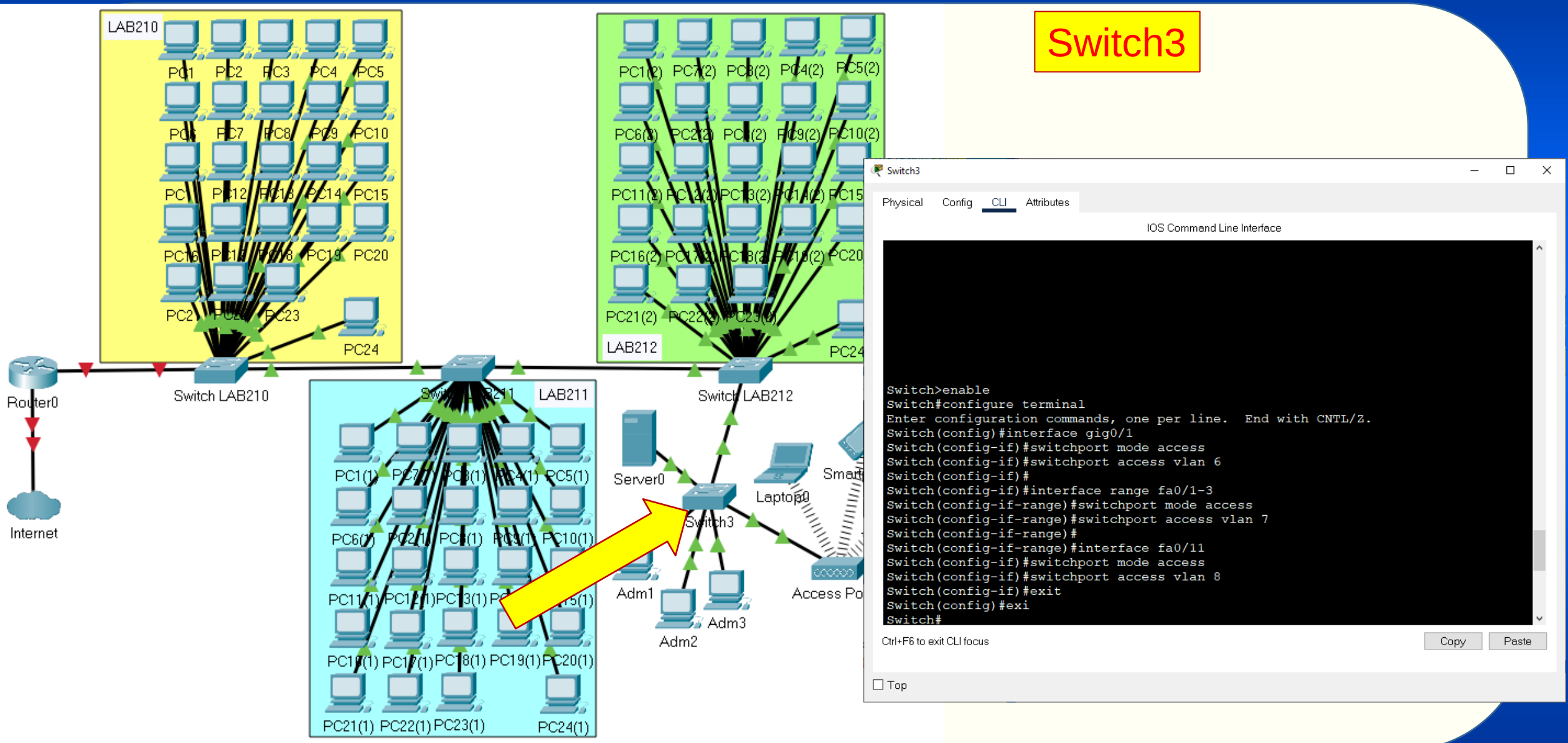
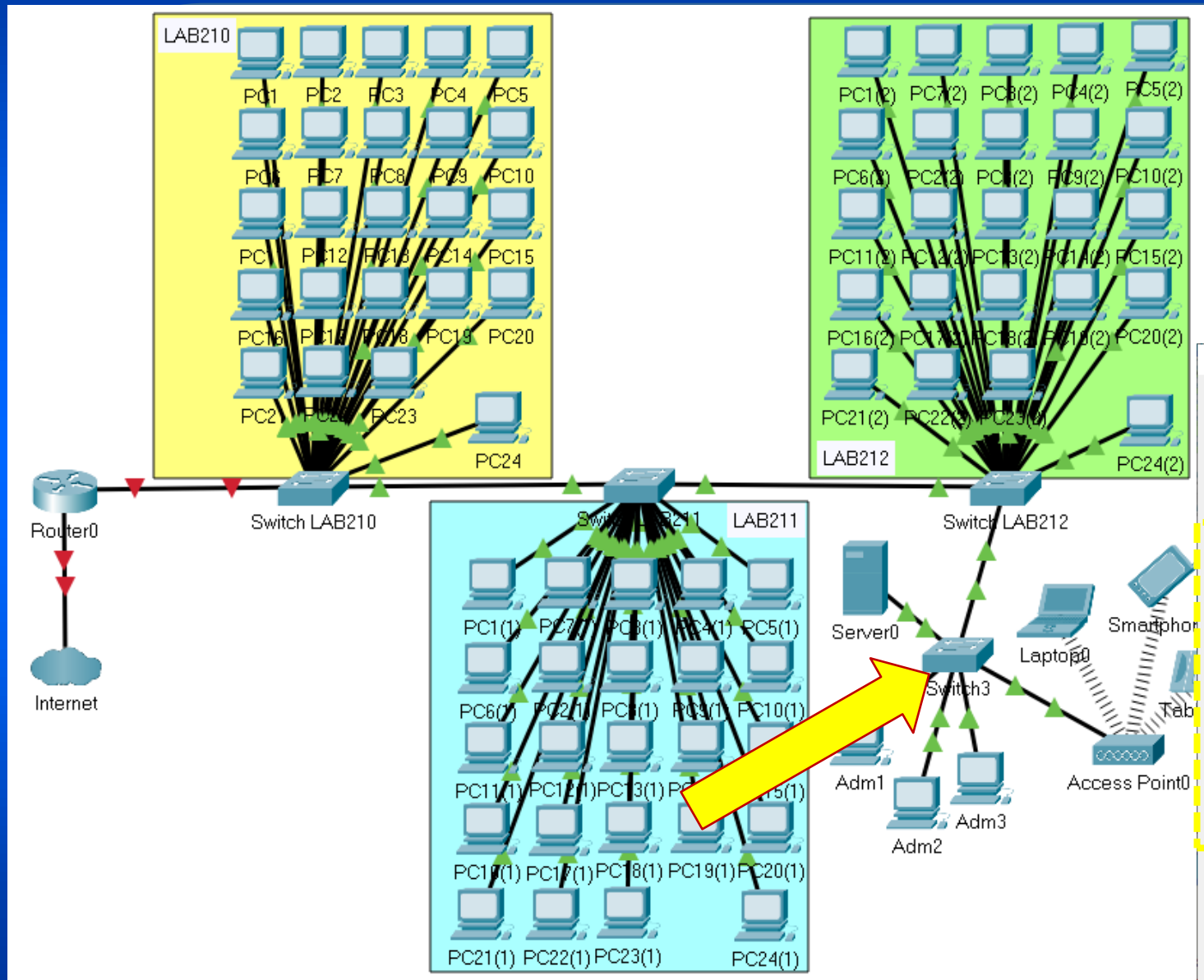
Configuração 2: Configurar interfaces no Switch Switch3



Análise 3: Switch Switch3



Switch3

Switch3

Physical Config CLI Attributes

IOS Command Line Interface

```
%SYS-5-CONFIG_I: Configured from console by console

Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/4, Fa0/5, Fa0/6, Fa0/7
                                                 Fa0/8, Fa0/9, Fa0/10, Fa0/12
                                                 Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
2    lab210                            active
3    lab211                            active
4    lab212                            active
5    profe                             active
6    server                            active    Gig0/1
7    adm                               active    Fa0/1, Fa0/2, Fa0/3
8    wifi                              active    Fa0/11
99   native                            active
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                   active
1005 trnet-default                     active

VLAN Type  SAID       MTU   Parent RingNo BridgeNo Stp  BrdgMode Trans1 Trans2
 --More--
```

Ctrl+F6 to exit CLI focus

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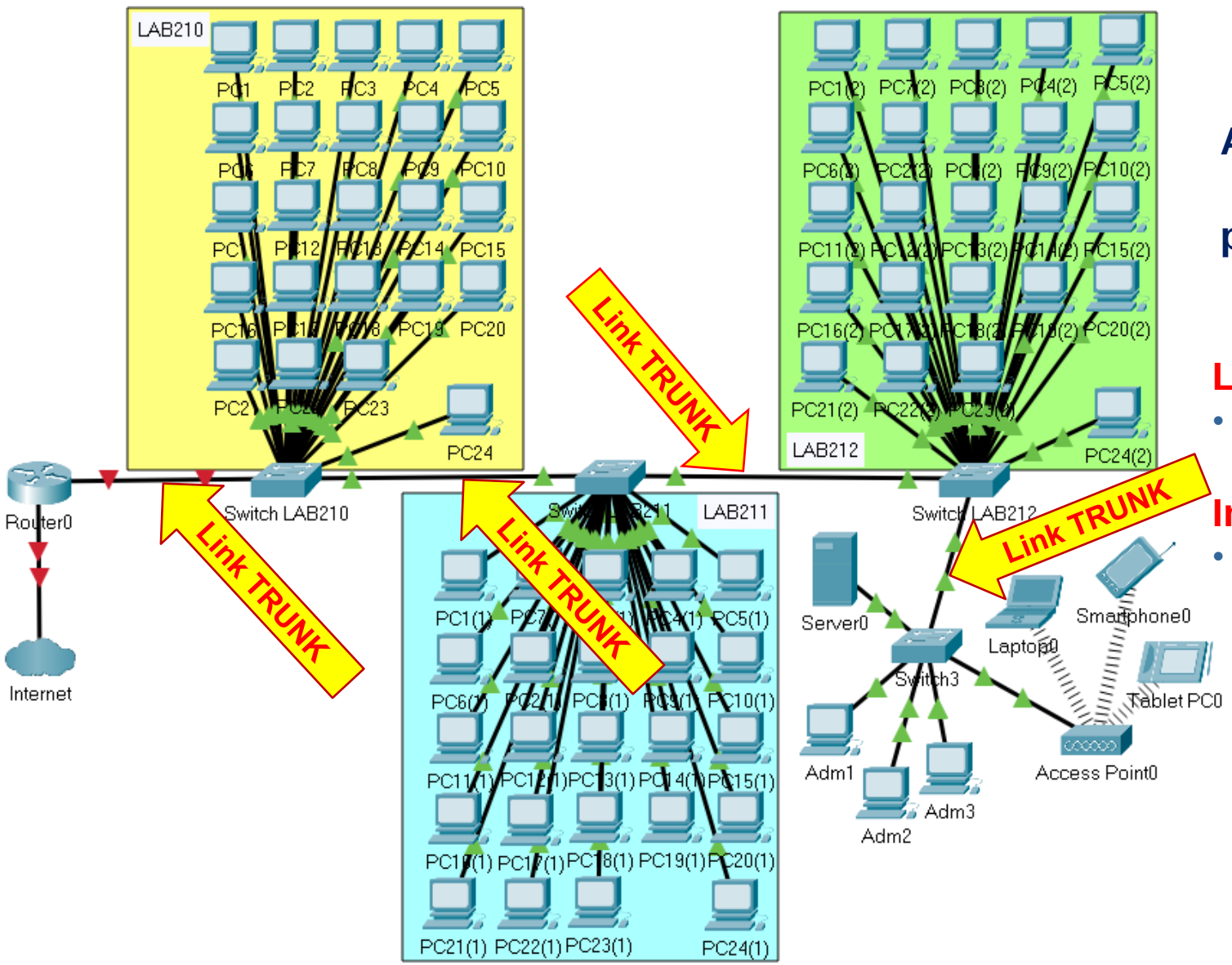
Top

Portas (interfaces) e links

TRUNK

Análise 1: TRUNK



Agora que as VLANs foram criadas e as interfaces associadas a cada VLAN, precisaremos configurar as interfaces e links Trunk

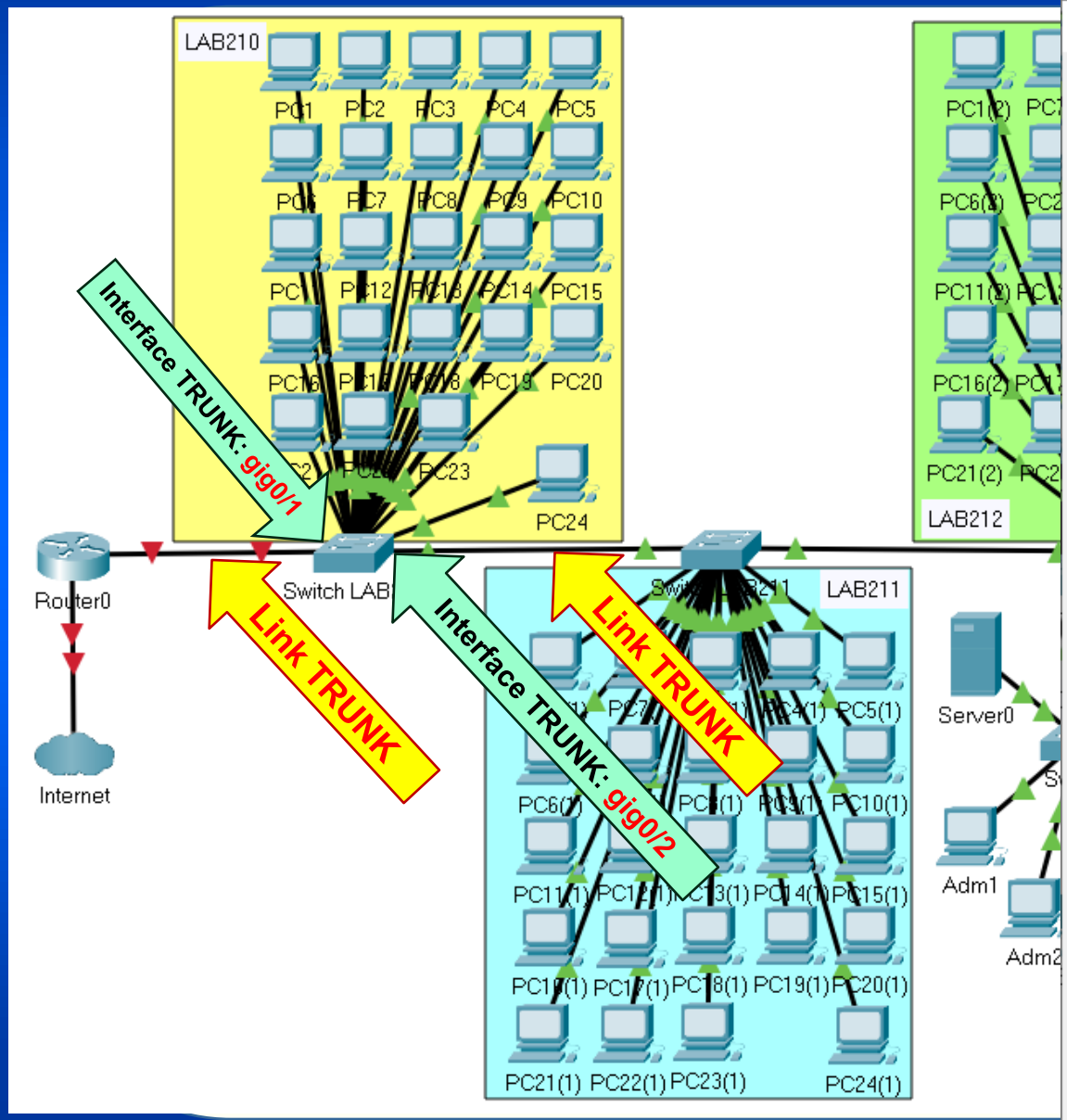
Link *Trunk*:

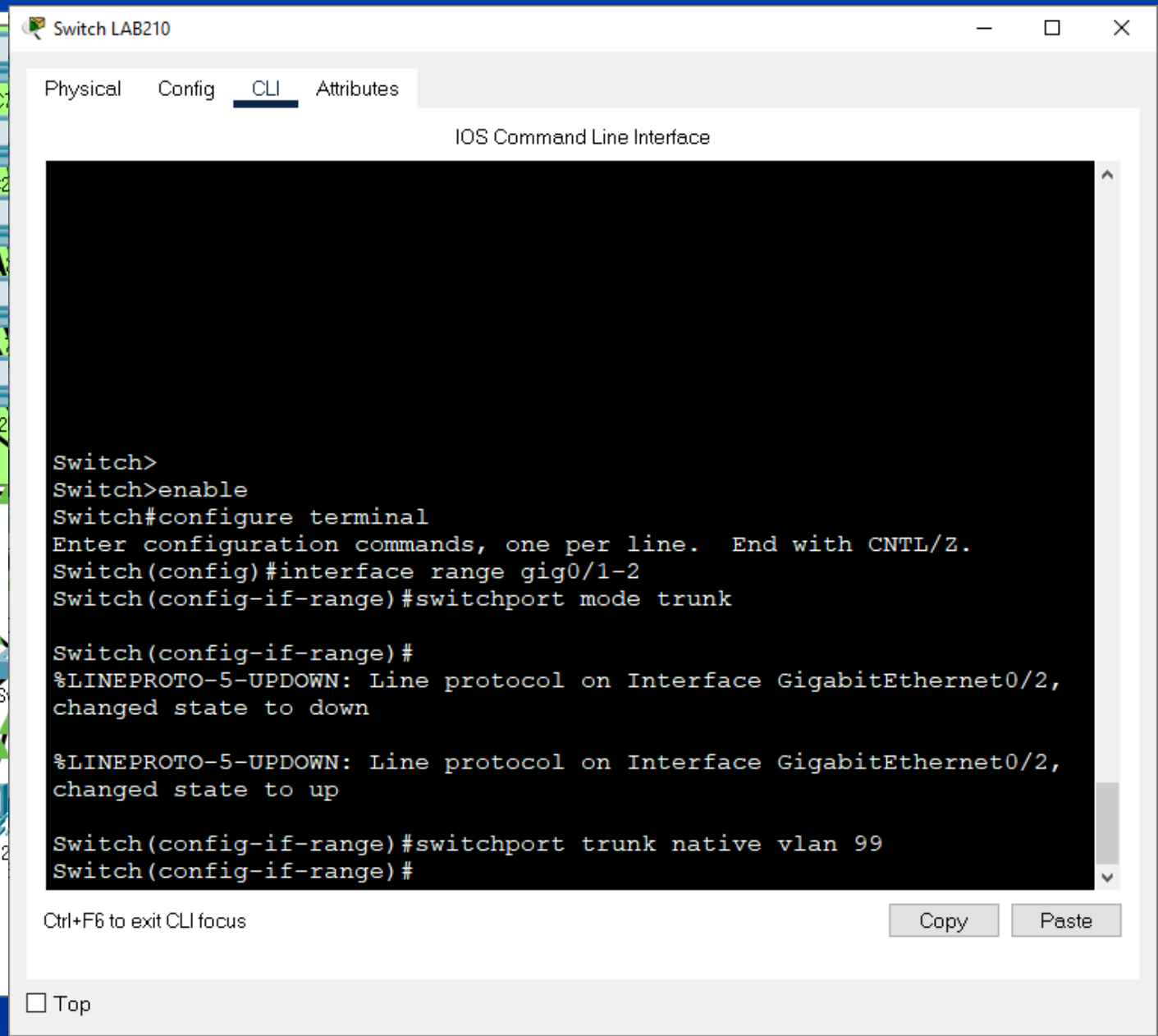
- Carrega o tráfego de múltiplas VLANs;

Interface *Trunk*:

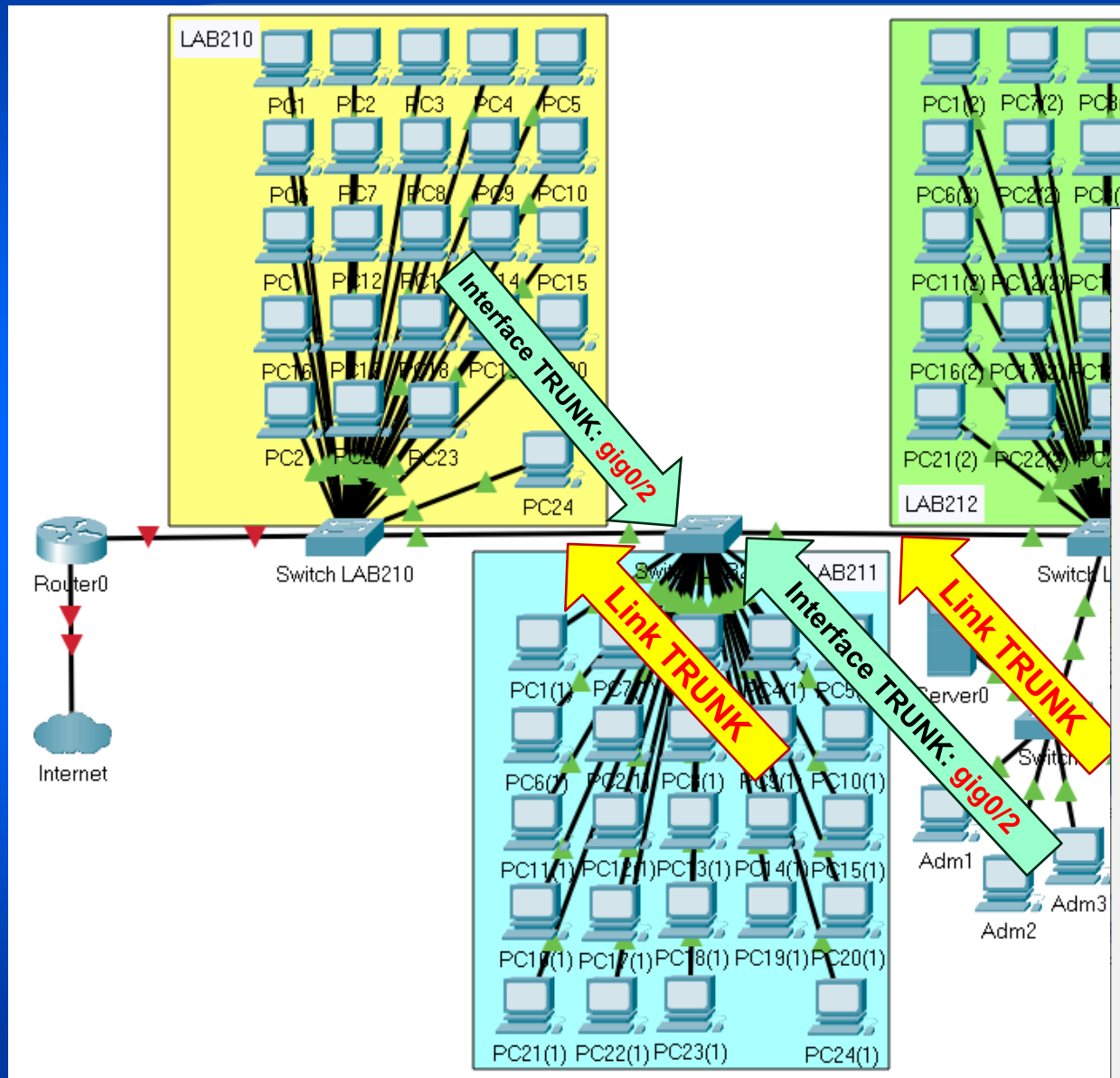
- A(s) interface(s) do switch conectada(s) pelo *link trunk* precisam pertencer a todas as VLANs do switch.

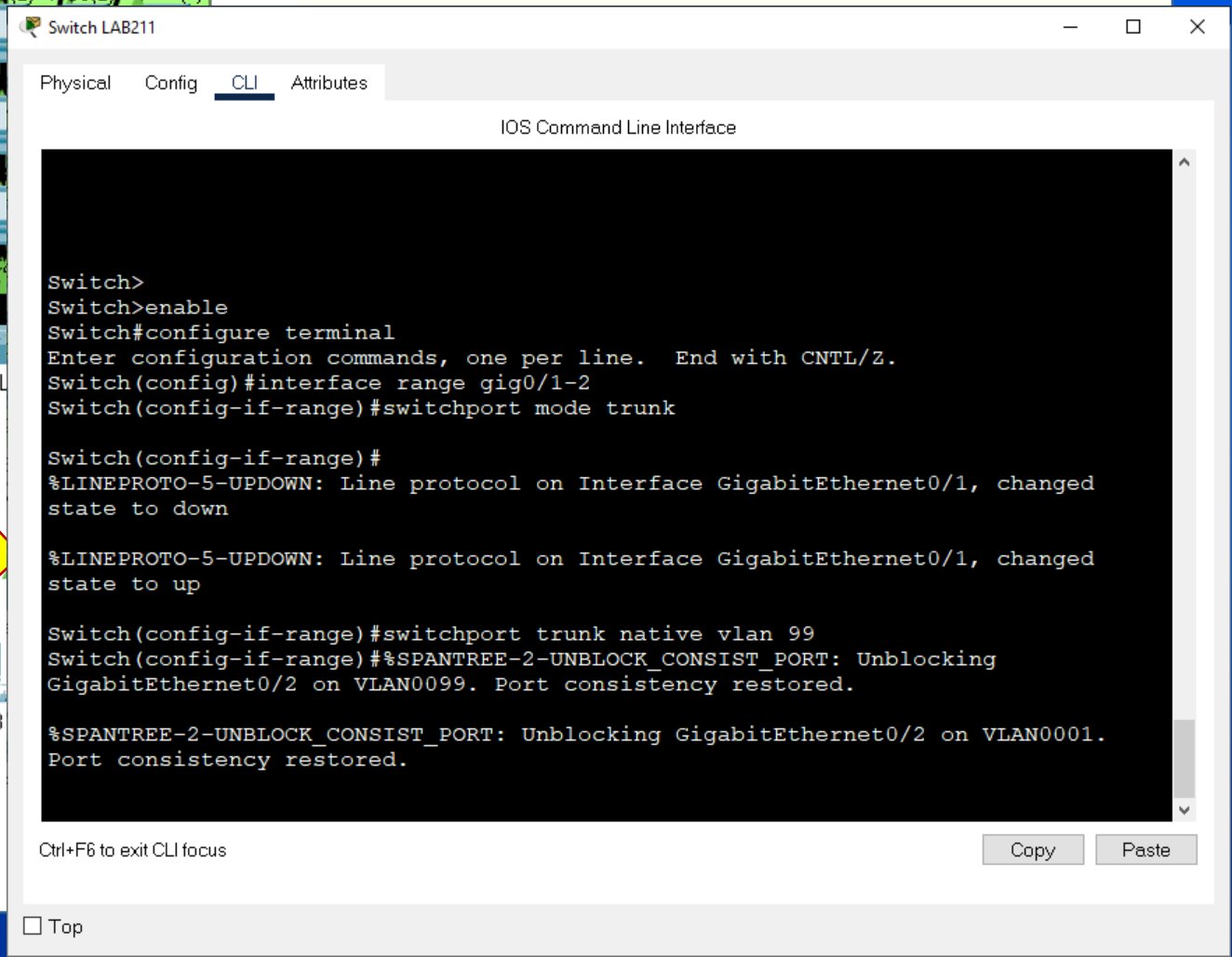
Configuração 1: TRUNK no Switch LAB210



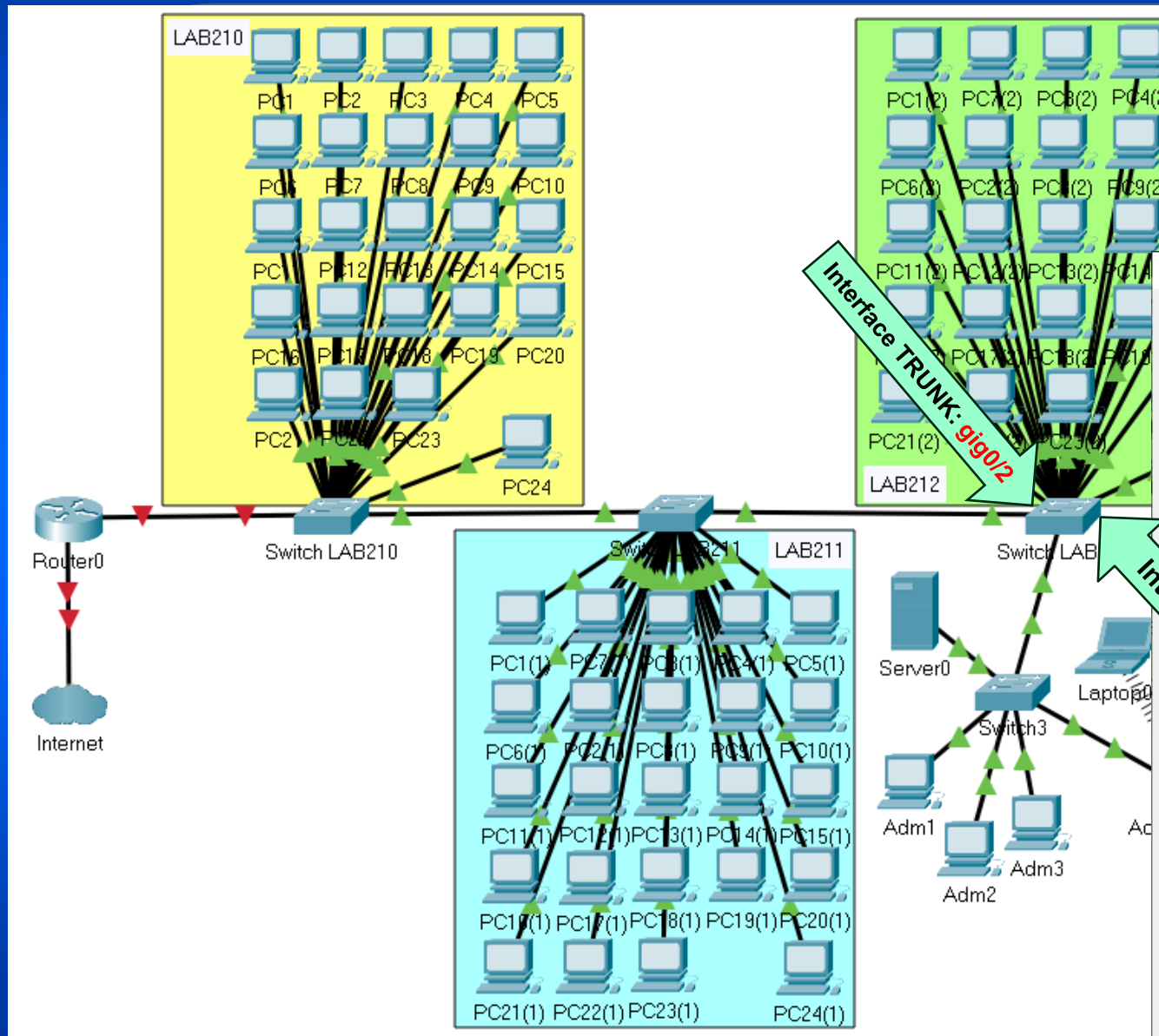


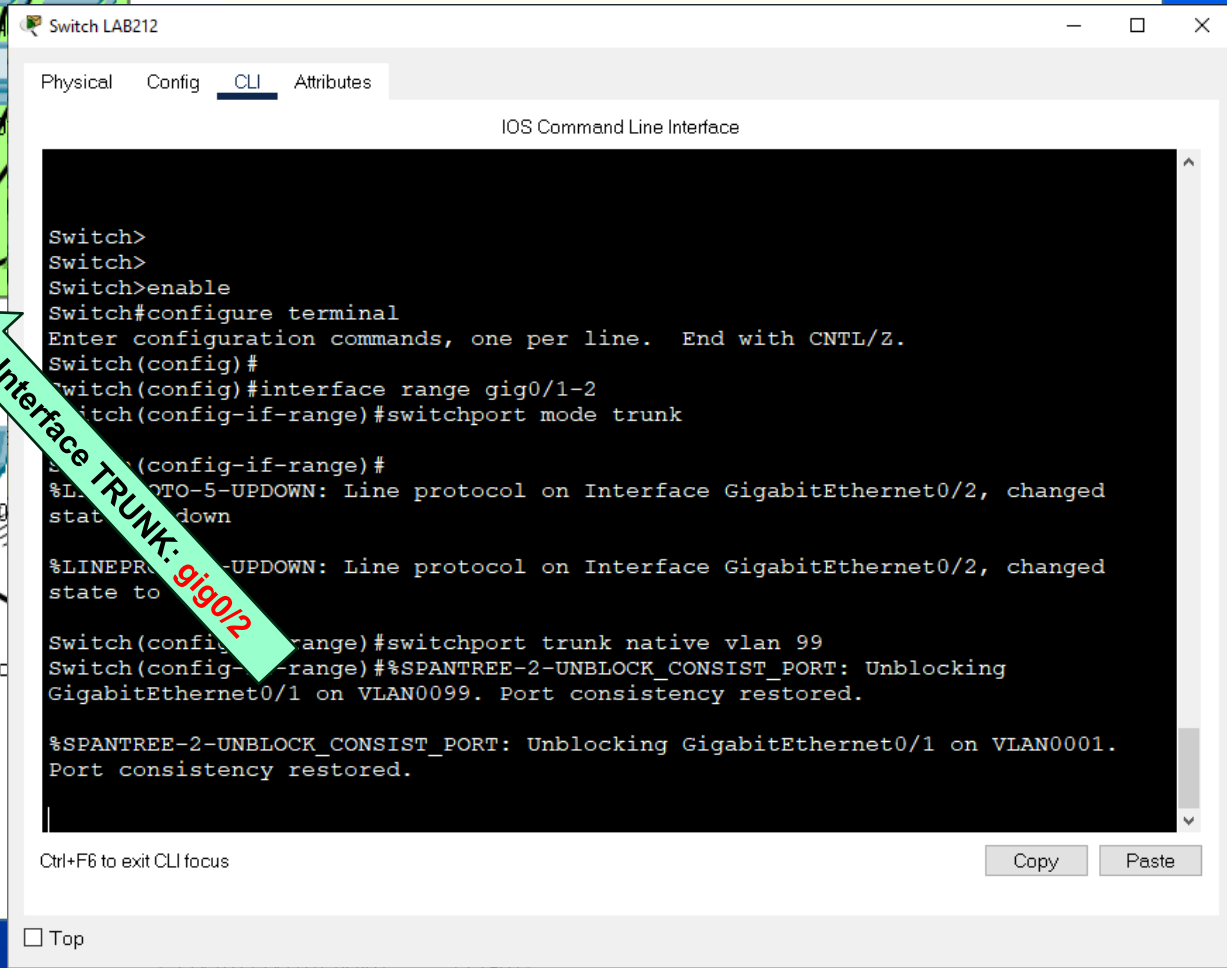
Configuração 2: TRUNK no Switch LAB211



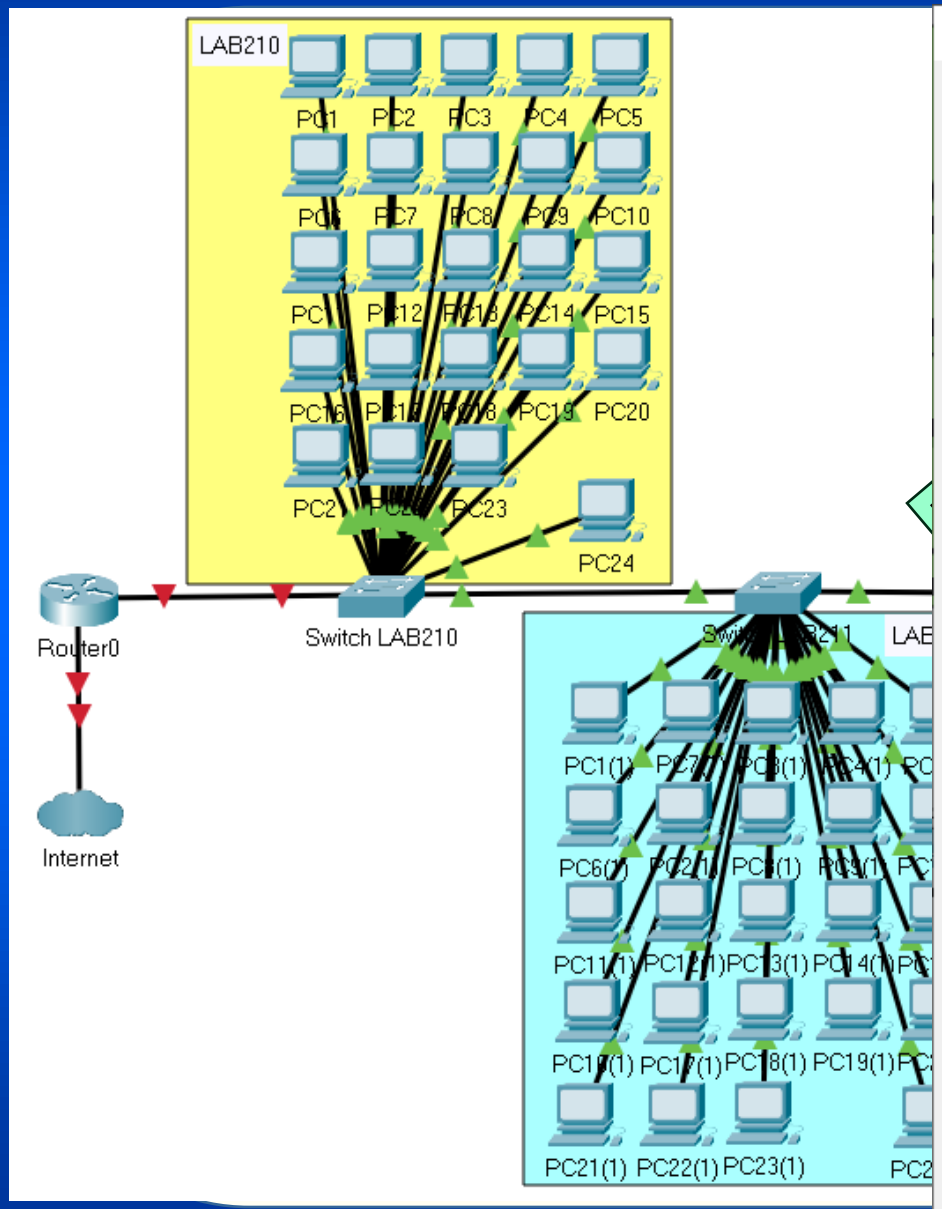


Configuração 3: TRUNK no Switch LAB211





Configuração 4: TRUNK no Switch3



Switch3

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
GigabitEthernet0/2 VLAN1.

%SPANTREE-2-BLOCK_PVID_LOCAL: Blocking GigabitEthernet0/2 on VLAN0001.
Inconsistent local vlan.



Switch>
Switch>
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface gig0/2
Switch(config-if)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on
GigabitEthernet0/2 (1), with Switch GigabitEthernet0/2 (99).

Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk native vlan 99
Switch(config-if)#%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking
GigabitEthernet0/2 on VLAN0099. Port consistency restored.

%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking GigabitEthernet0/2 on VLAN0001.
Port consistency restored.


Switch(config-if)#
```

Ctrl+F6 to exit CLI focus

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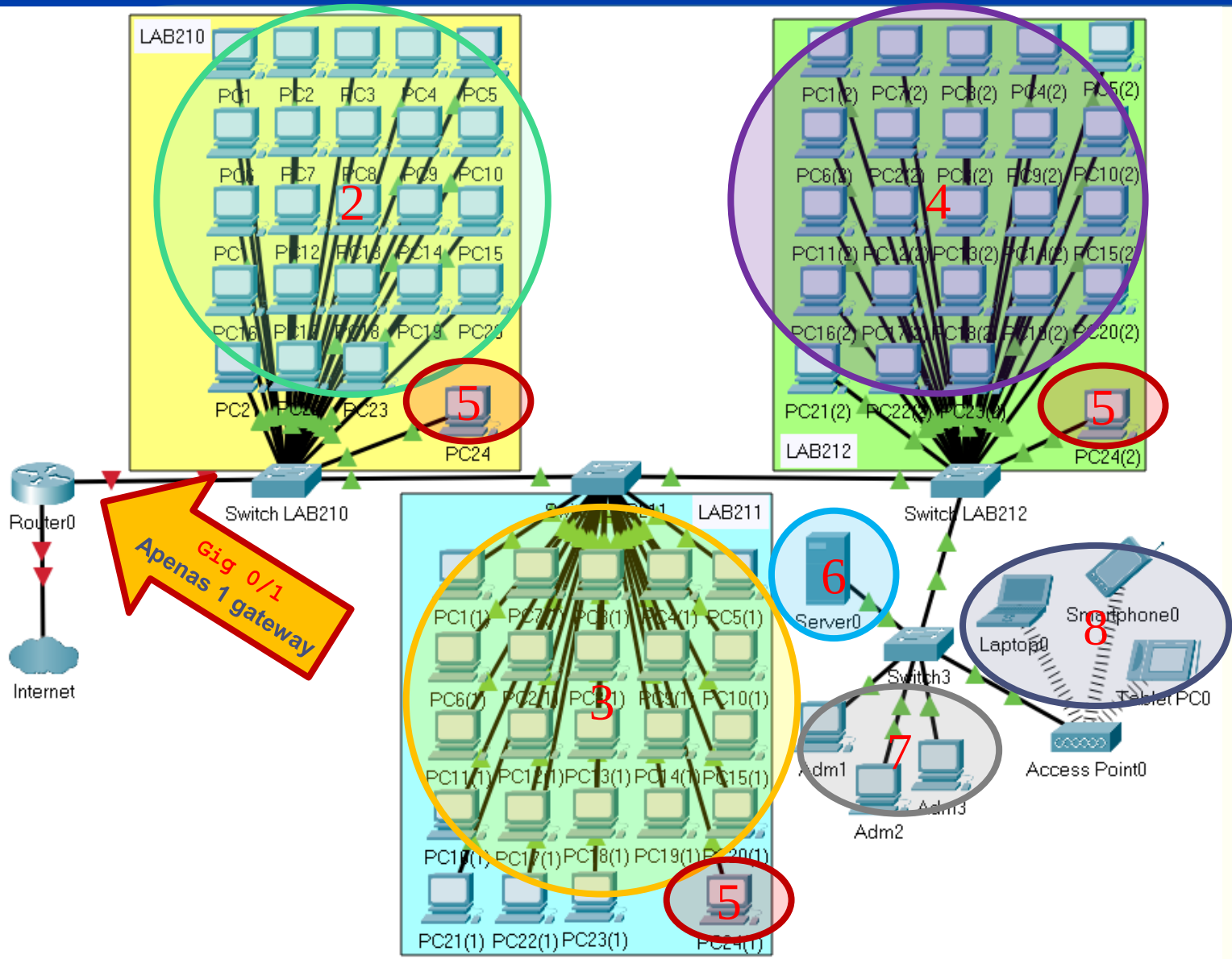
Top

Configuração de endereçamento IP (1ª Parte)

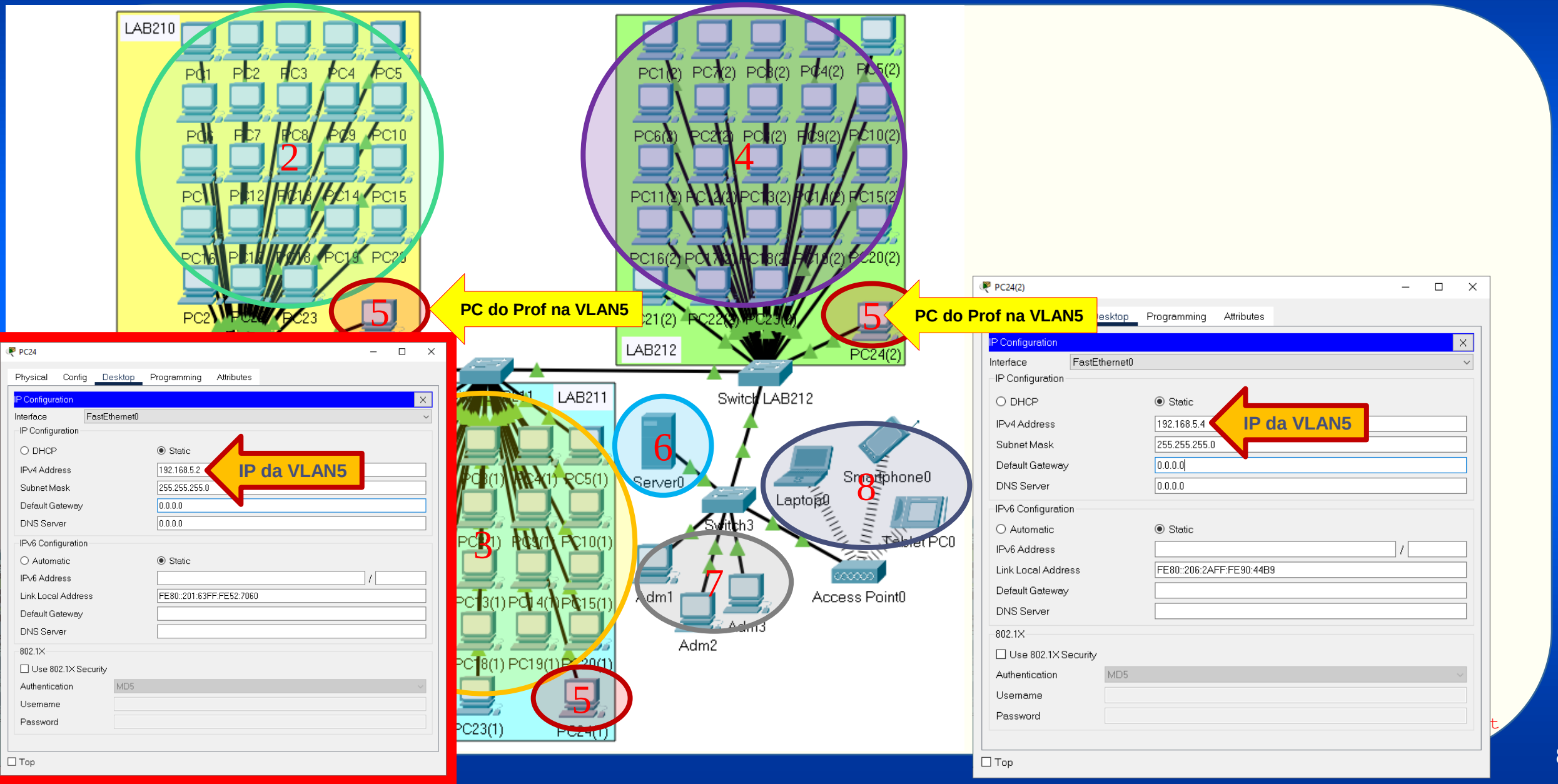
Análise 1: Endereçamento IP e Gateway



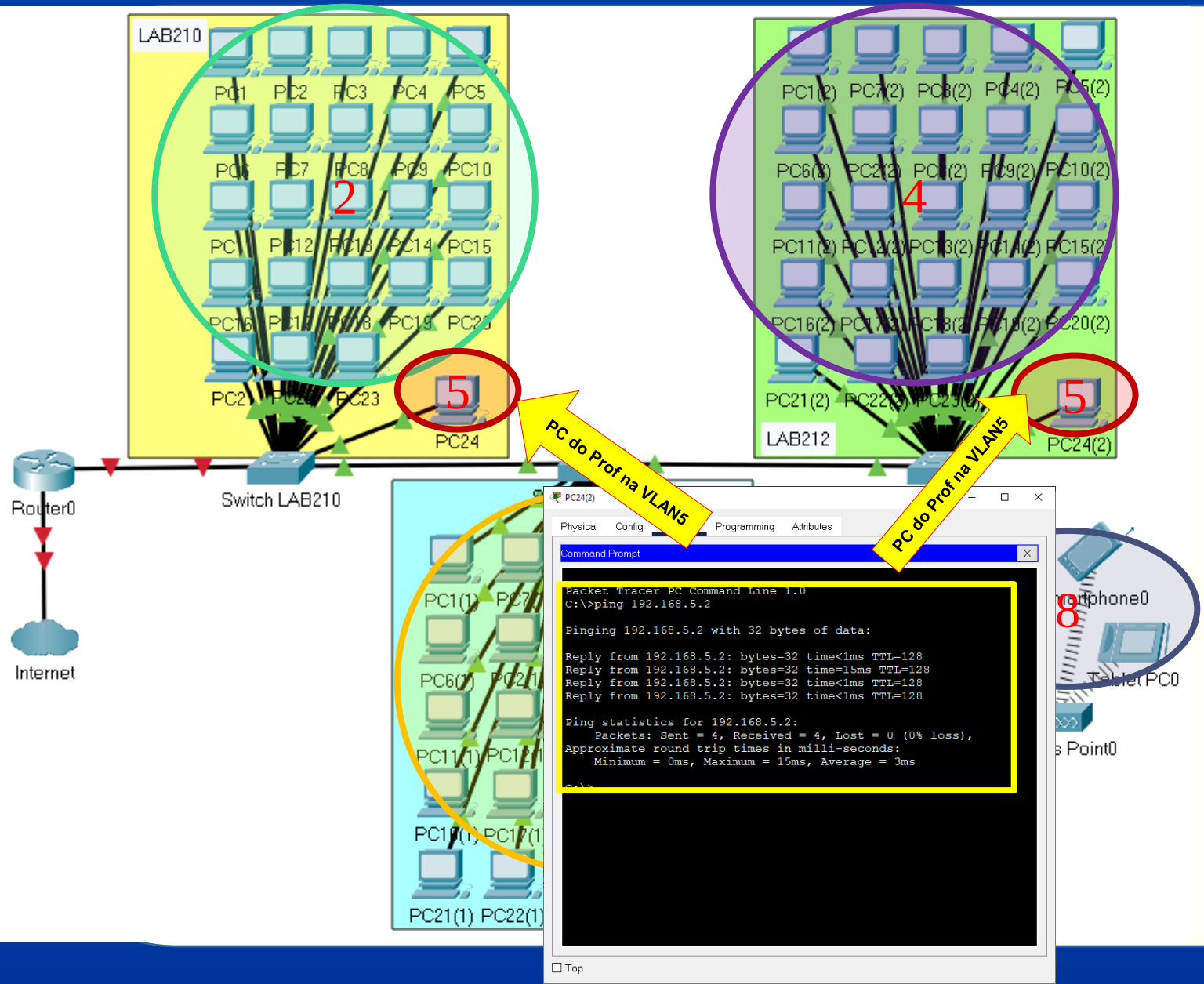
Como fica o endereçamento IP?

- Temos 7 VLANs diferentes!
- Cada VLAN é uma rede diferente (*e um domínio de broadcast diferente*) que exige um endereço de rede ÚNICO e exclusivo
- Cada VLAN precisará ter seu próprio GATEWAY.
- Vamos utilizar o seguinte esquema de endereçamento:
  - Vlan2: `192.168.2.0 /24`
  - Vlan3: `192.168.3.0 /24`
  - Vlan4: `192.168.4.0 /24`
  - Vlan5: `192.168.5.0 /24`
  - Vlan6: `192.168.6.0 /24`
  - Vlan7: `192.168.7.0 /24`
  - Vlan8: `192.168.8.0 /24`
- Precisaremos 'virtualizar' o gateway (interface `Gig 0/1`), dividindo ele em 7 sub-interfaces (7 gateways virtuais)

Análise 2: Endereçamento IP e Gateway

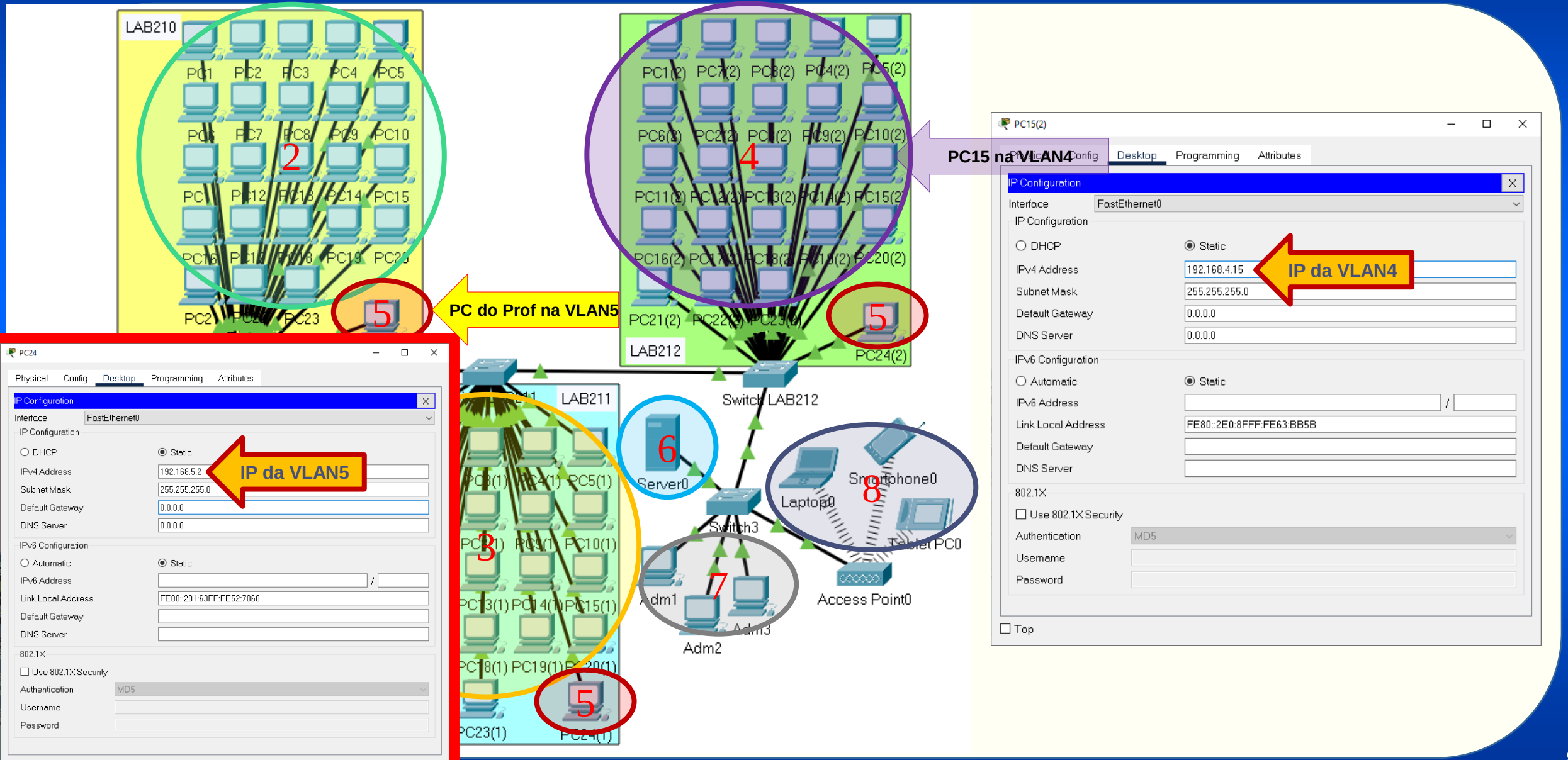


Análise 3: Endereçamento IP e Gateway

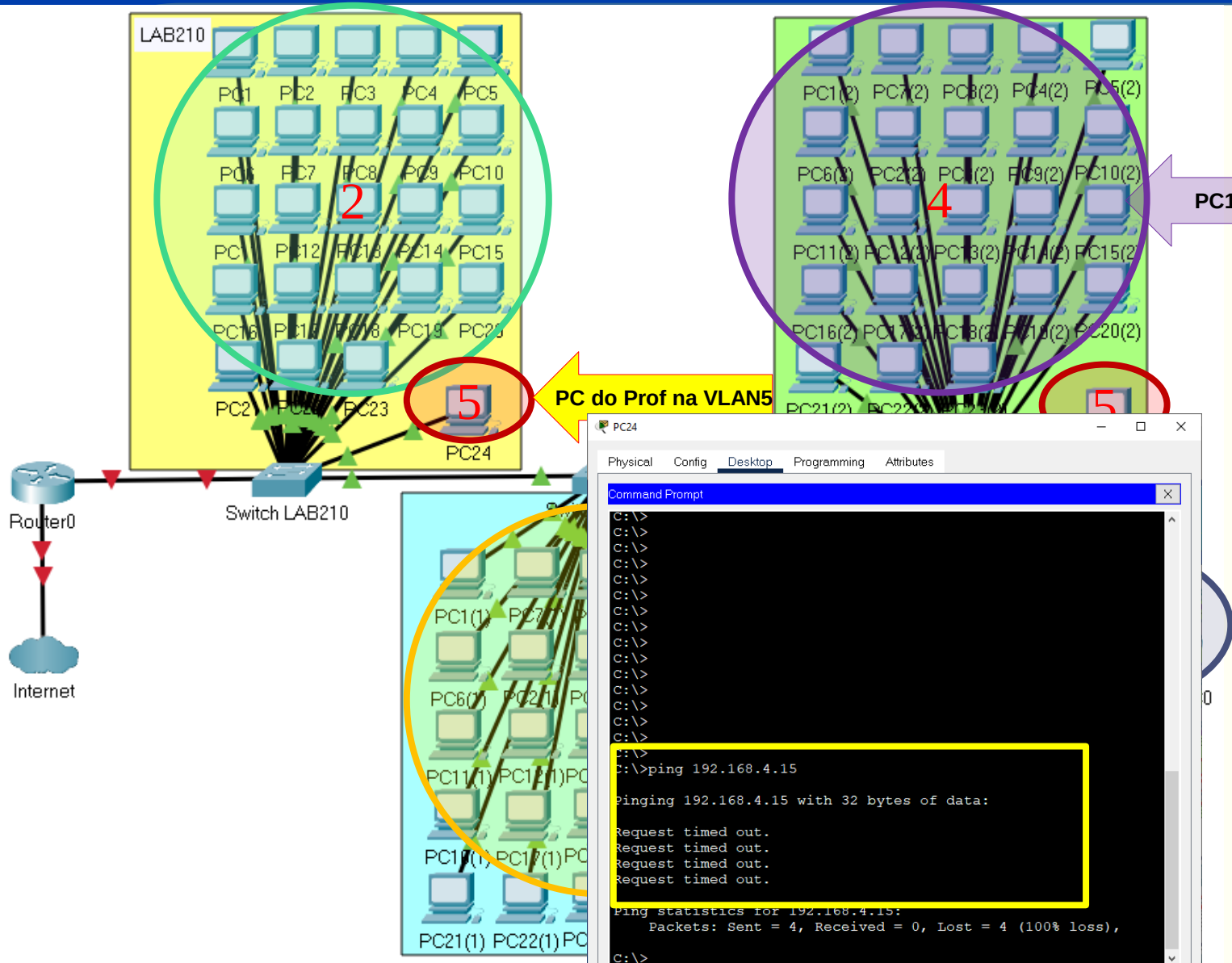


Observe que É POSSÍVEL estabelecer comunicação entre equipamentos que estão NA MESMA VLAN (ou seja, na mesma rede)

Análise 4: Endereçamento IP e Gateway



Análise 5: Endereçamento IP e Gateway



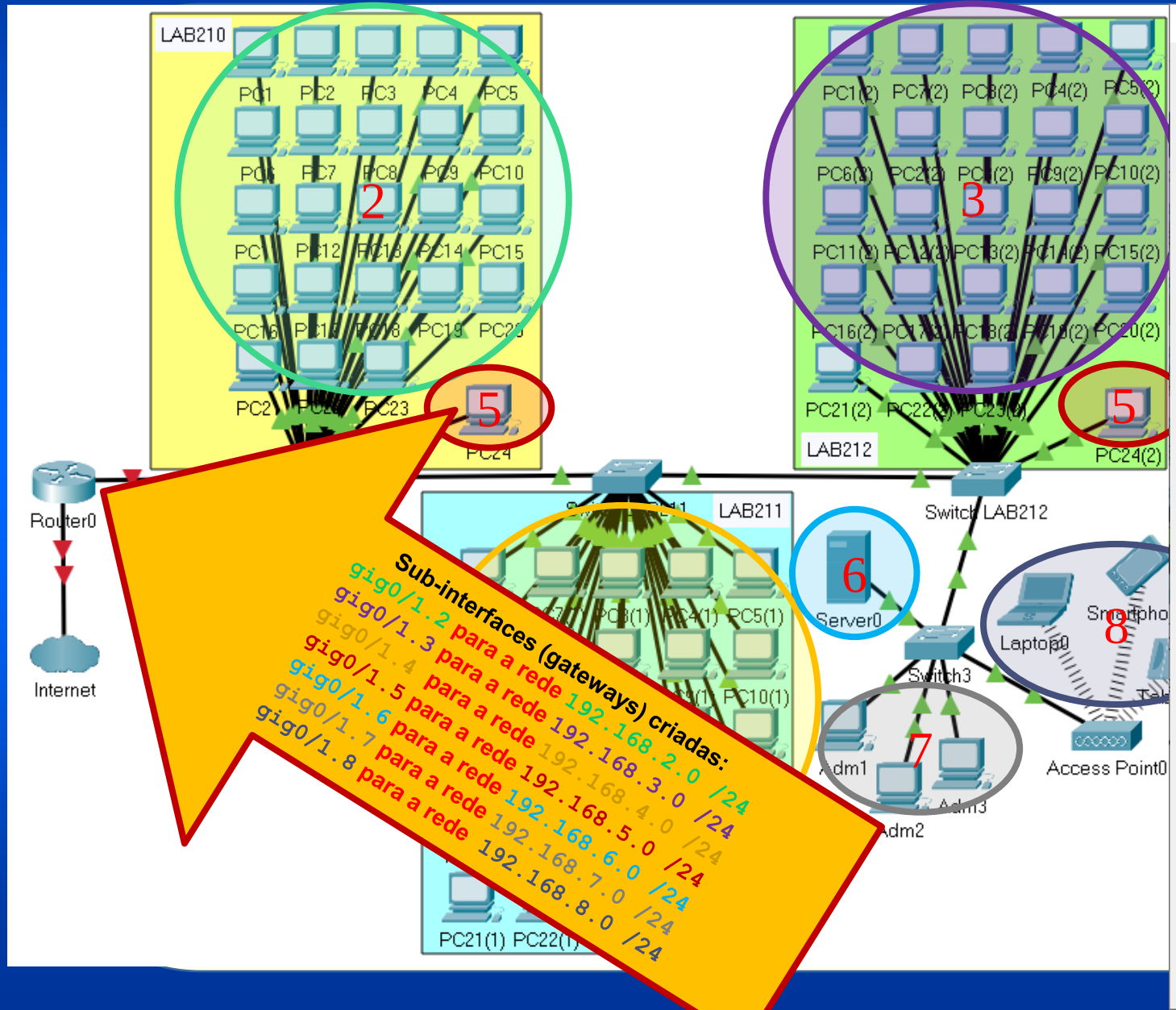
Observe que NÃO É POSSÍVEL estabelecer comunicação entre equipamentos que estão em VLANs diferentes (ou seja, em redes diferntes)

Para estabelecer a comunicação será necessário o uso do Roteador

(Roteador: equipamento que permite a comunicação entre redes diferentes)

Configuração sub-interfaces (gateways virtuais) no roteador

Configuração 1: Endereçamento IP e Gateway



Router2

Physical | Config | CLI | Attributes

IOS Command Line Interface

```
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface gig0/1.2
Router(config-subif)#encapsulation dot1q 2
Router(config-subif)#ip address 192.168.2.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#interface gig0/1.3
Router(config-subif)#encapsulation dot1q 3
Router(config-subif)#ip address 192.168.3.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#interface gig0/1.4
Router(config-subif)#encapsulation dot1q 4
Router(config-subif)#ip address 192.168.4.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#interface gig0/1.5
Router(config-subif)#encapsulation dot1q 5
Router(config-subif)#ip address 192.168.5.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#interface gig0/1.6
Router(config-subif)#encapsulation dot1q 6
Router(config-subif)#ip address 192.168.6.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#interface gig0/1.7
Router(config-subif)#encapsulation dot1q 7
Router(config-subif)#ip address 192.168.7.1 255.255.255.0
Router(config-subif)#
Router(config-subif)#interface gig0/1.8
Router(config-subif)#encapsulation dot1q 8
Router(config-subif)#ip address 192.168.8.1 255.255.255.0
Router(config-subif)#exit
Router(config)#interface gig0/1
Router(config-if)#no shutdown
```

Ctrl+F6 to exit CLI focus | Copy | Paste

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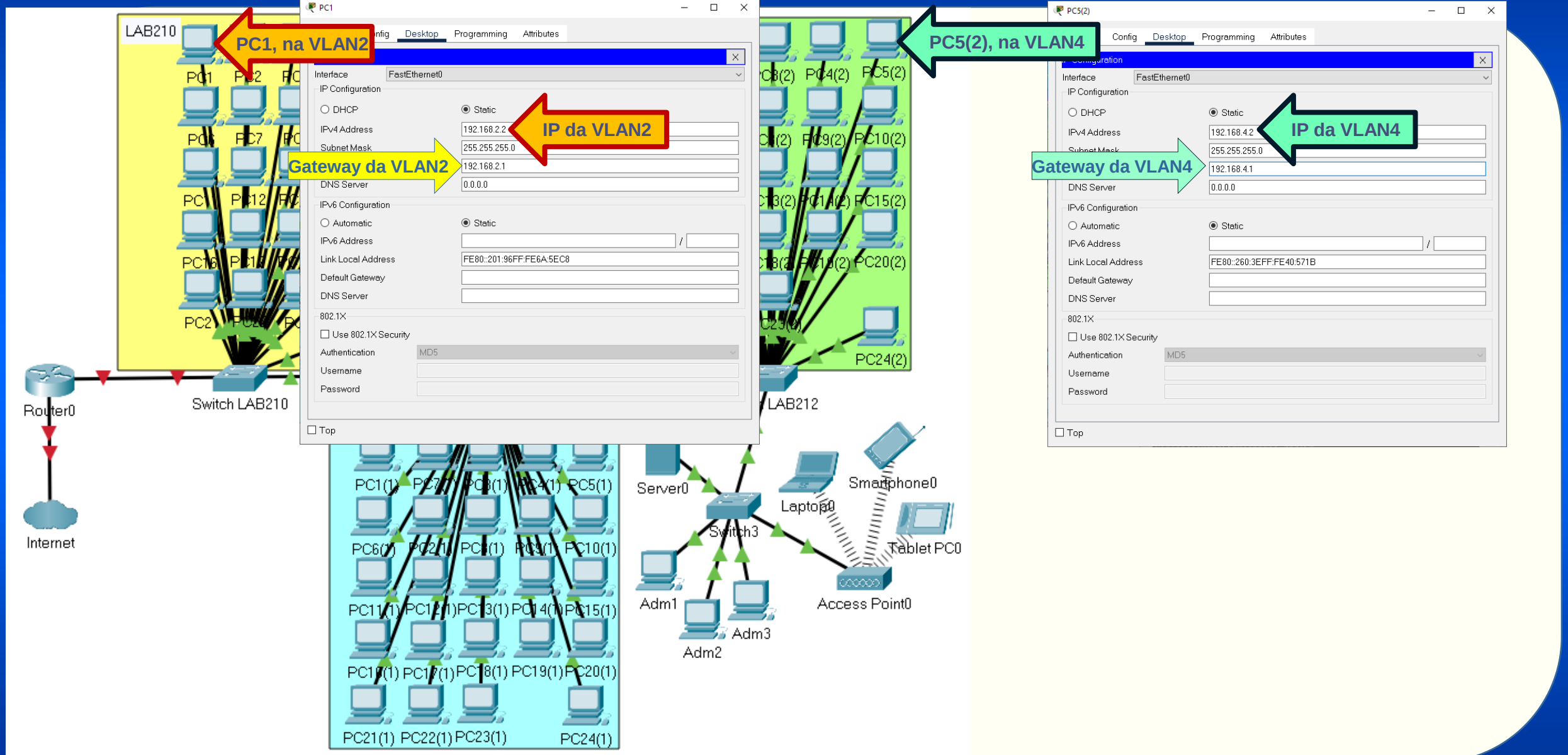
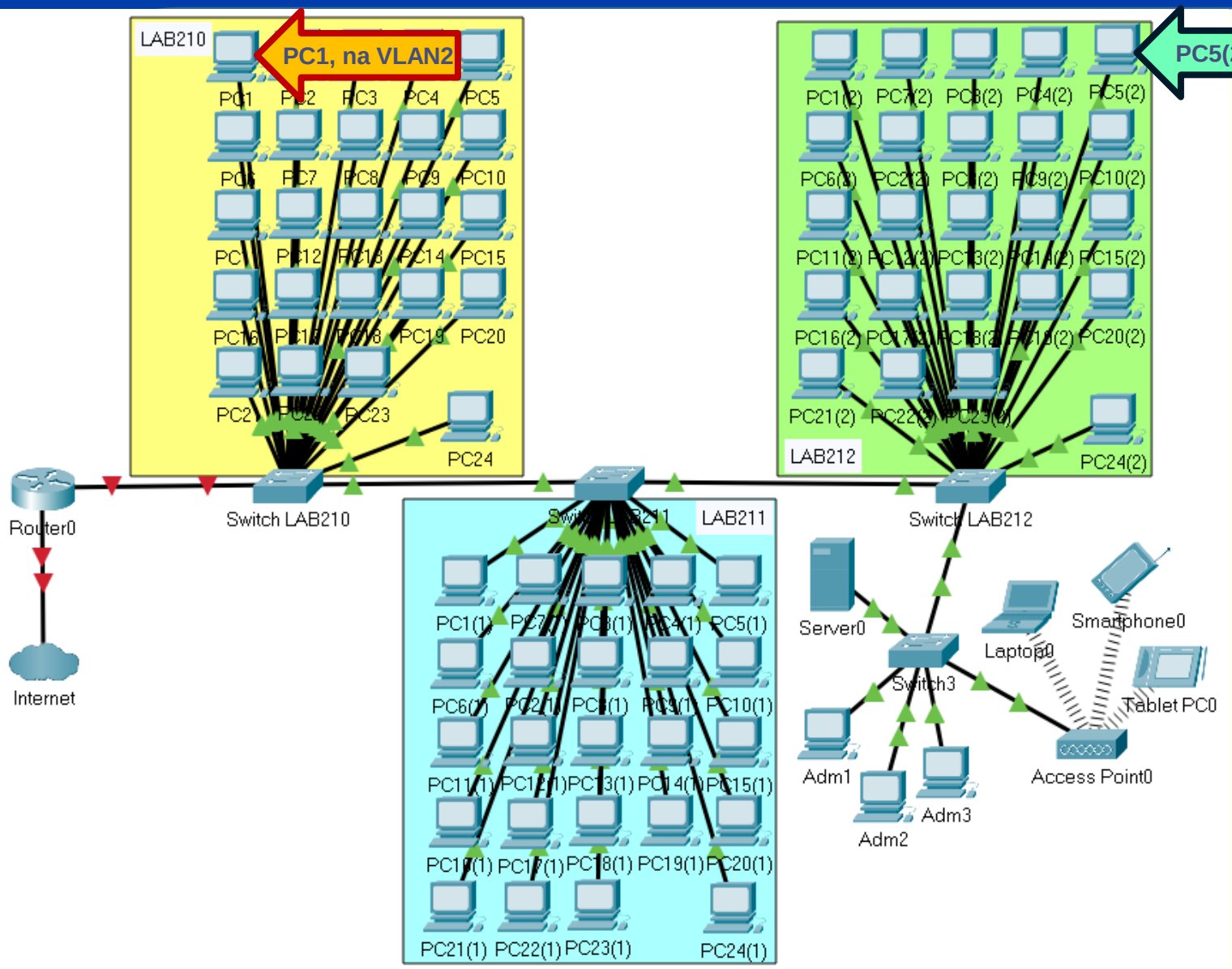
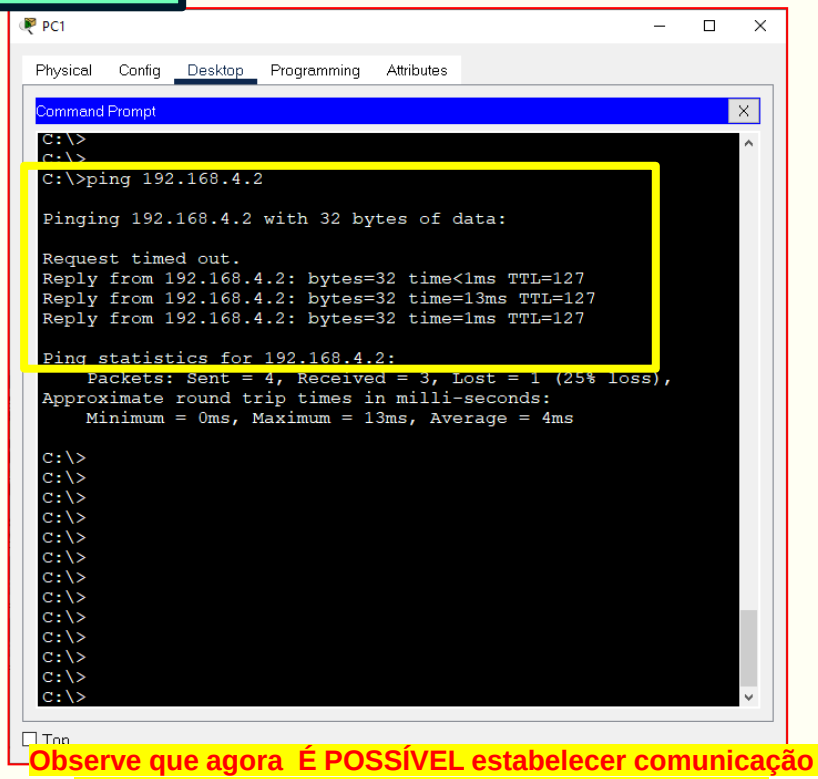
Configuração 2: Endereçamento IP e Gateway



Análise: Endereçamento IP e Gateway





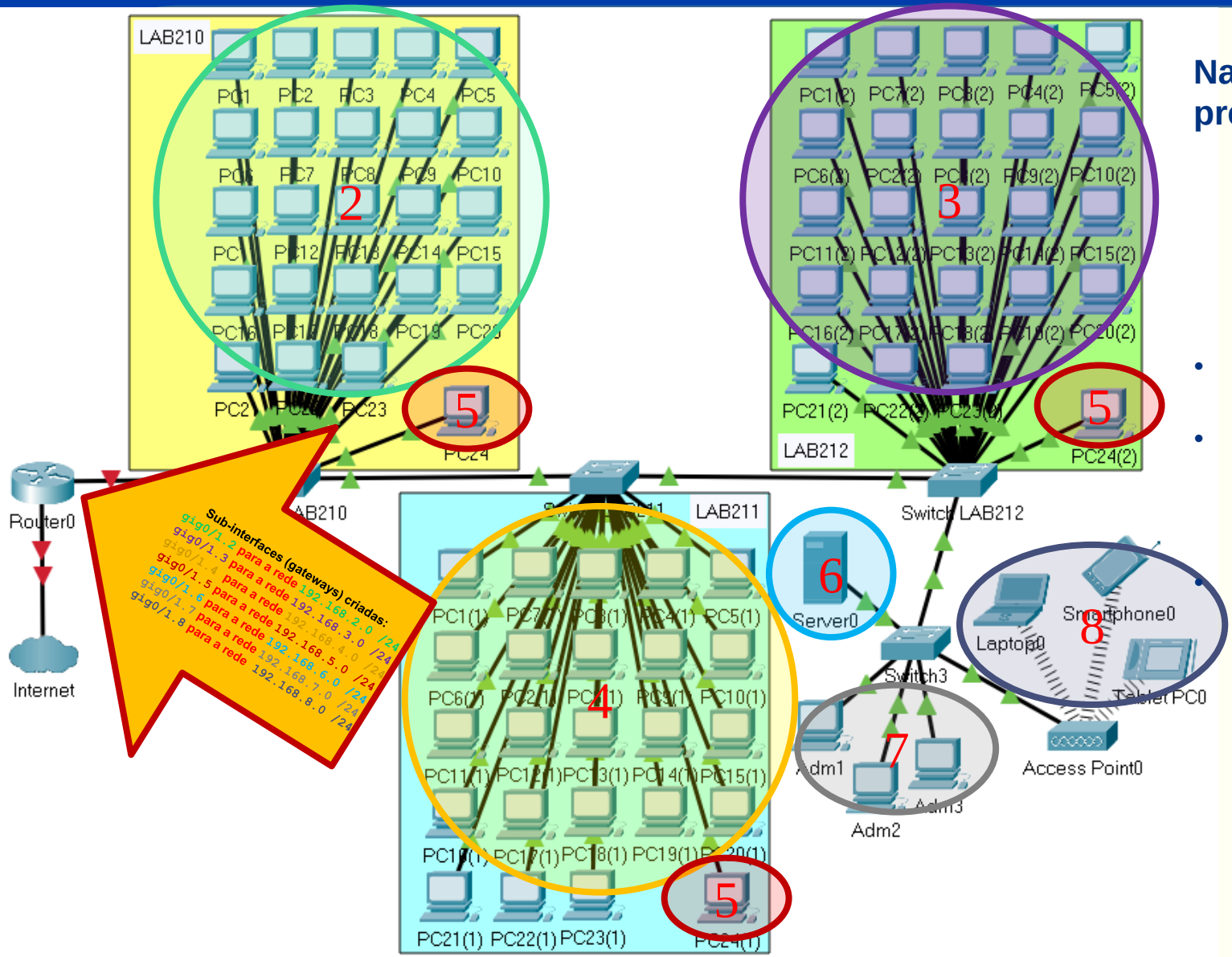
Observe que agora É POSSÍVEL estabelecer comunicação entre equipamentos que estão em VLANs diferentes (ou seja, em redes diferntes)

Para estabelecer a comunicação é necessário o uso do Roteador

(Roteador: equipamento que permite a comunicação entre redes diferentes)

Configuração de endereçamento IP (1ª Parte)

Análise : Endereçamento IP e Gateway



Na topologia temos 103 dispositivos finais que precisarão de endereço IP:

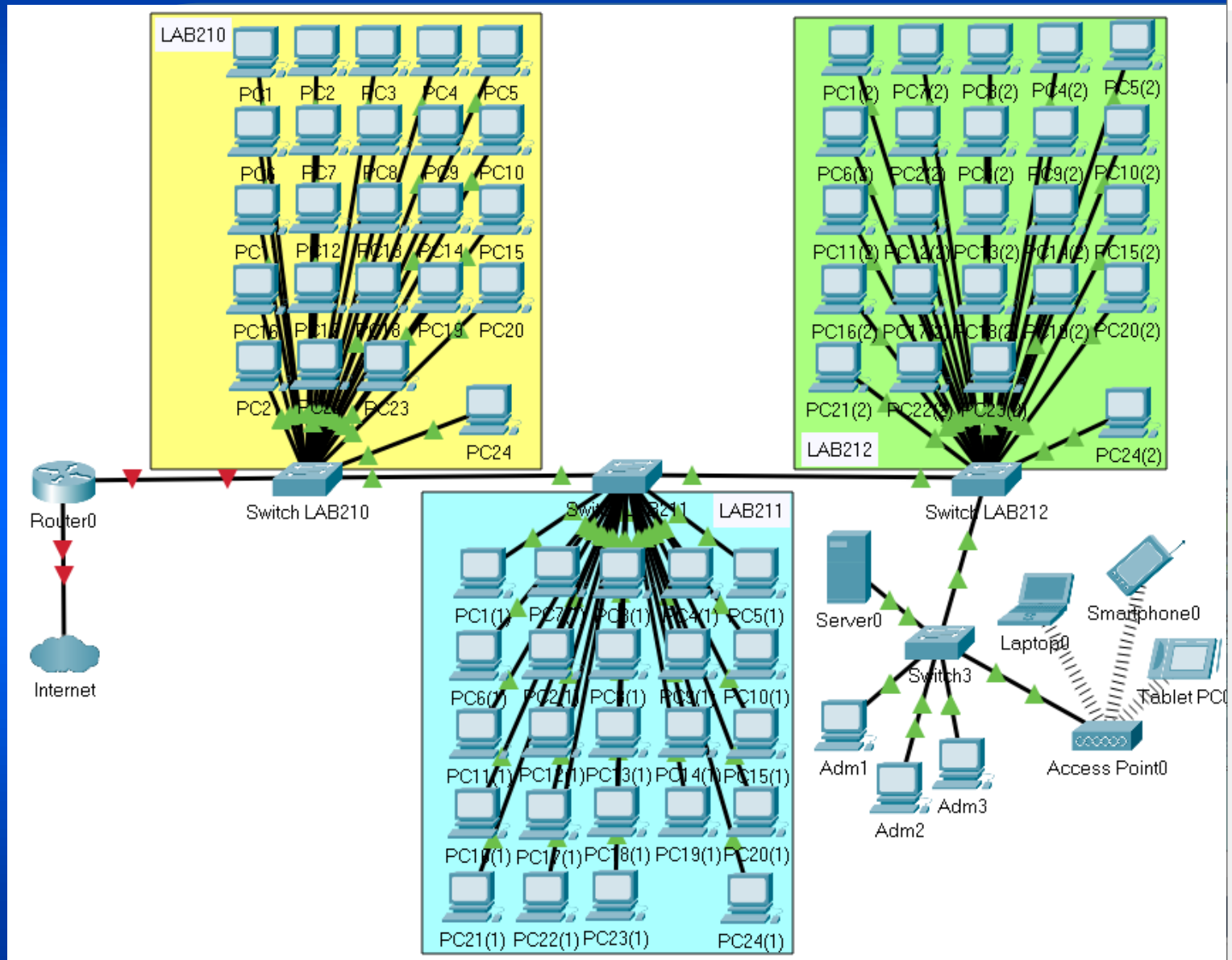
- **75 PCs**
- **1 servidor**
- **1 notebook**
- **1 smartphone**
- **1 tablet**

- **Faremos uso de DHCP ou configuração manual?**

- **Lembre-se que um servidor DHCP só existe no escopo da rede local. Então cada VLAN (cada rede) precisará ter seu próprio DHCP.**

- **Podemos configurar um serviço DHCP em cada das subinterfaces do roteador (gateways)**
  - **7 VLANs Redes = 7 subinterfaces = 7 serviços DHCP**

Configuração: Serviço DHCP no Roteador



Router2

Physical | Config | CLI | Attributes

IOS Command Line Interface

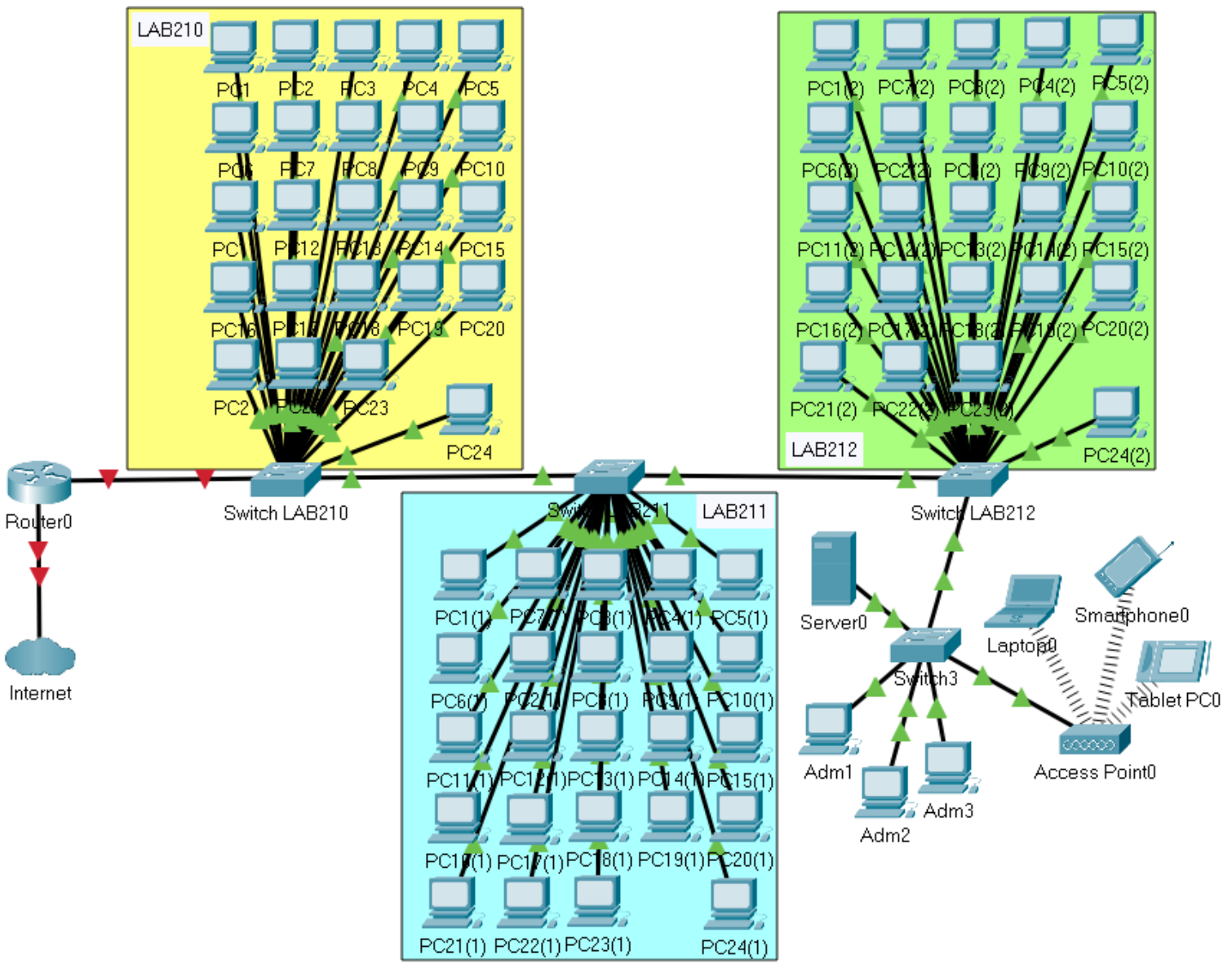
```
Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip dhcp pool VLAN2
Router(dhcp-config)#default-router 192.168.2.1
Router(dhcp-config)#net 192.168.2.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
Router(dhcp-config)#ip dhcp pool VLAN3
Router(dhcp-config)#default-router 192.168.3.1
Router(dhcp-config)#net 192.168.3.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
Router(dhcp-config)#ip dhcp pool VLAN4
Router(dhcp-config)#default-router 192.168.4.1
Router(dhcp-config)#net 192.168.4.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
Router(dhcp-config)#ip dhcp pool VLAN5
Router(dhcp-config)#default-router 192.168.5.1
Router(dhcp-config)#net 192.168.5.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
Router(dhcp-config)#ip dhcp pool VLAN6
Router(dhcp-config)#default-router 192.168.6.1
Router(dhcp-config)#net 192.168.6.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
Router(dhcp-config)#ip dhcp pool VLAN7
Router(dhcp-config)#default-router 192.168.7.1
Router(dhcp-config)#net 192.168.7.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
Router(dhcp-config)#ip dhcp pool VLAN8
Router(dhcp-config)#default-router 192.168.8.1
Router(dhcp-config)#net 192.168.8.0 255.255.255.0
Router(dhcp-config)#dns-server 192.168.6.2
Router(dhcp-config)#
```

Ctrl+F6 to exit CLI focus

Copy | Paste

Top

Configuração: Serviço DHCP no Roteador



VLAN

Resumo de configuração

Resumo da Configuração de VLAN

Criar VLAN

```
Switch(vlan)#vlan 2
Switch(vlan)#name marketing
Switch(vlan)#exit
```

Definir a VLAN de uma porta em modo acesso

```
Switch(config)#interface fastethernet f0/9
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 2
```

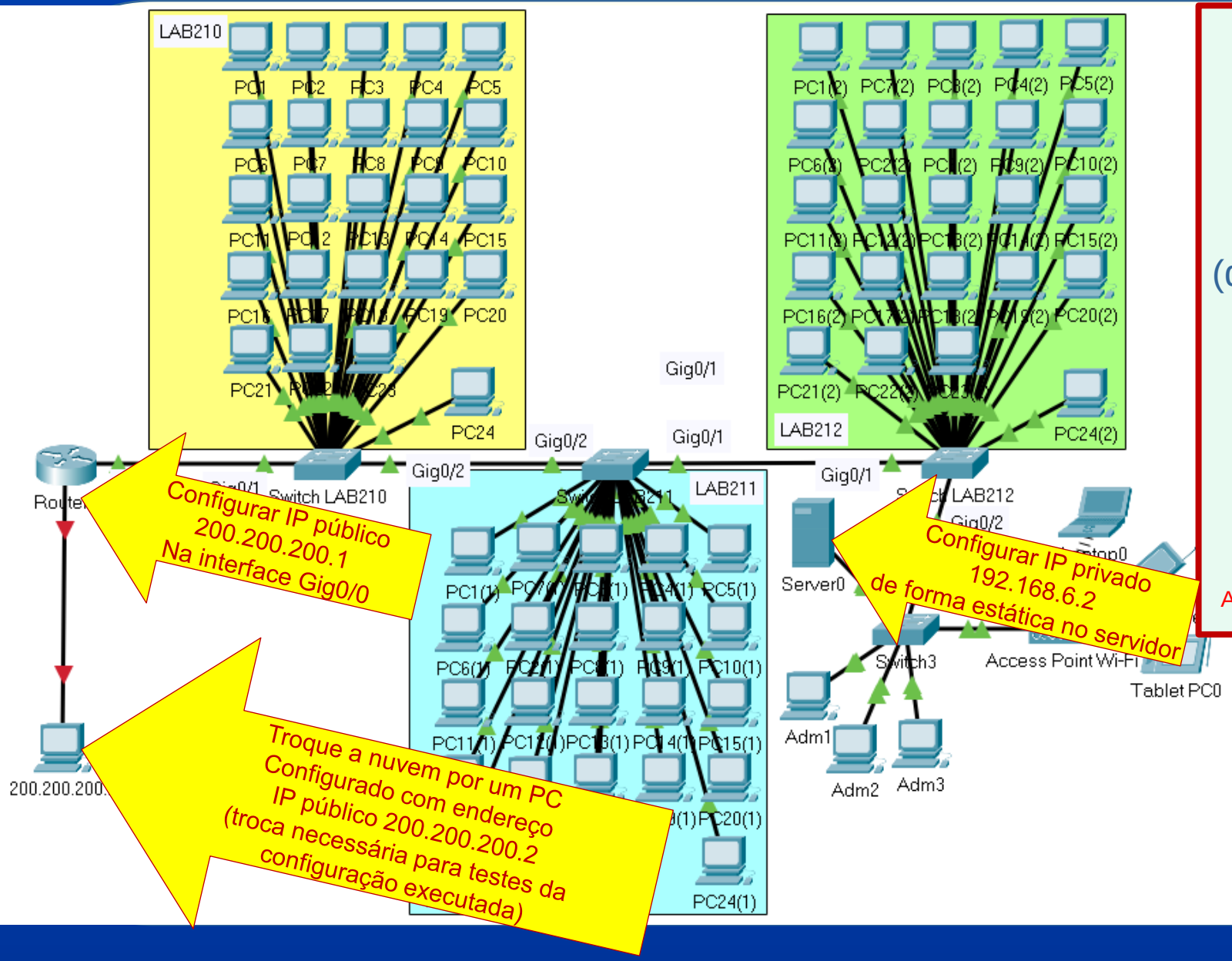
Definir a VLAN de uma porta em modo tronco (*trunk*)

```
Switch(config-if)#interface ethernet f0/7
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan all
```

Desafio NAT

Acrescente uma configuração NAT

Configuração: NAT no Router0



Atividade Final:

Realizar as configurações apontadas nas setas e configurar NAT (do tipo PAT) no Router2 associando o IP Público 200.200.200.1 (para a porta TCP 80) ao endereço IP privado no Server0 (para a porta TCP 80)

Dica:
Veja o roteiro de configuração no arquivo
Aula11_2023 Configuração NAT Estático, Dinâmico e PAT.pdf

Para estudo:

https://www.netacad.com/

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Tanenbaum, Andrew S; Wetherall, David. Redes de Computadores. São Paulo: Pearson Prentice Hall, 2011. 5ª edição americana. ISBN 978-85-7605-924-0.

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