PROJECTO DE REDES 2012 / 2013

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1 Objectivos

Montagem da componente física de uma rede.
Configuração de equipamento activo.
Definição e configuração de ACLs.
Debugging e trobleshooting.

2 Topologia

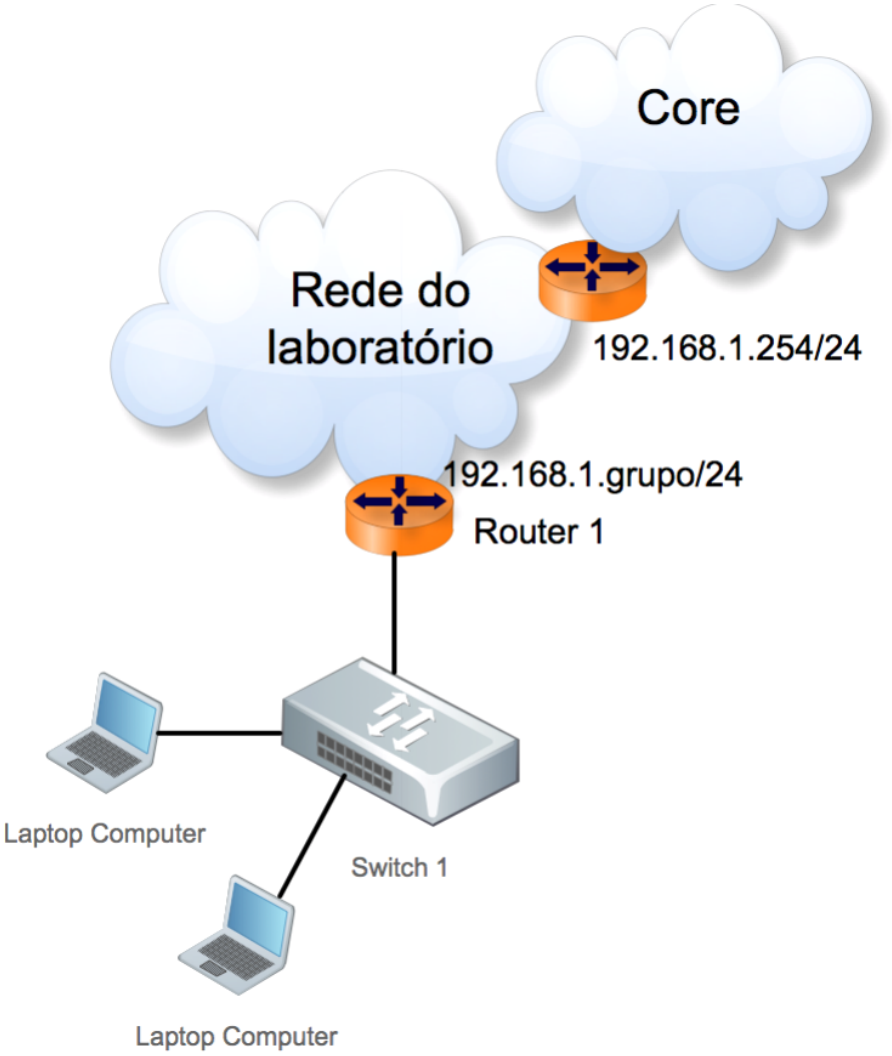

Figura 1: Topologia do trabalho

3 Tabela das Vlans

Vlan ID	Nome	Portas	Modo	Default Gateway dos membros dessa Vlan
99	Gestão	Fa 0/24	tagged	10.99.grupo.254
		Mgmt	N/A	
10	Funcionários	Fa 0/24	tagged	10.100.grupo.254
		Fa 0/0-12	untagged	
20	Alunos	Fa 0/24	tagged	10.200.grupo.254
		Fa 0/13-16	untagged	
30	guest	Fa 0/17-20	untagged	N/A

4 Configurações

4.1 Configurações iniciais

- Apagar as configurações iniciais do router e do switch

```
ROUTER:
Router>enable
Router#configure terminal
Router(config)#erase startup-config
Router(config)#reload

SWITCH:
Switch>enable
Switch#delete flash:vlans.dat
Switch#erase startup-config
Switch#reload
```

4.2 Configurações básicas

Configure o Router de acordo com as orientações seguintes:
1. Atribua um nome a cada router de acordo com a topologia descrita (hostname)
2. Desabilite o DNS lookup.
3. Configure uma password para aceder ao modo Exec Privileged Mode. (Password=class)
4. Configure a message-of-the-day banner.
5. Configure uma password para ligações do tipo console. (Password=class)
6. Configure uma password para ligações do tipo VTY. (Password=class)

```
Router>enable
Router#configure terminal
Router(config)#hostname Router1
Router1(config)#no ip domain lookup
Router1(config)#enable secret cisco
Router1(config)#line console 0
Router1(config-line)#password cisco
Router1(config-line)#login
Router1(config-line)#exit
Router1(config)#line vty 0 4
Router1(config-line)#password cisco
Router1(config-line)#login
```

```
Router1(config-line)#exit
Router1(config)#banner motd Hello Router1
Router1(config)#exit

Switch>enable
Switch#configure terminal
Switch(config)#hostname S1
S1(config)#enable secret class
S1(config)#line console 0
S1(config-line)#password class
S1(config-line)#login
S1(config-line)#exit
S1(config)#line vty 0 4
S1(config-line)#password class
S1(config-line)#login
S1(config-line)#exit
S1(config)#exit
S1#copy running startup-config
```

4.3 Configuração das interfaces dos Routers.

```
Router>enable
Router#configure terminal
Router(config)#interface FastEthernet0/1
Router1(config-if)#ip address 192.168.1.5 255.255.255.0
Router1(config)#no shutdown
Router1(config)#exit

Router#configure terminal
Router1(config)#interface FastEthernet0/0.10
Router1(config-subif)#encapsulation dot1Q 10
Router1(config-subif)# ip address 10.100.5.254 255.255.255.0
Router1(config-if)#no shutdown
Router1(config)#exit

Router1(config)#interface FastEthernet0/0.20
Router1(config-subif)#encapsulation dot1Q 20
Router1(config-subif)# ip address 10.200.5.254 255.255.255.0
Router1(config-if)#no shutdown
Router1(config)#exit

Router1(config)#interface FastEthernet0/0.30
Router1(config-subif)#encapsulation dot1Q 30
Router1(config-subif)# ip address 10.30.5.254 255.255.255.0
Router1(config-if)#no shutdown
Router1(config)#exit

Router1(config)#interface FastEthernet0/0.99
Router1(config-subif)#encapsulation dot1Q 99
Router1(config-subif)# ip address 10.99.5.254 255.255.255.0
Router1(config-if)#no shutdown
Router1(config)#exit
```

4.3.1 Configuração do DHCP

```
Router>enable
Router#configure terminal
Router(config)#ip dhcp pool vlan99
```

```
Router1(dhcp-config)#network 10.99.5.0 255.255.255.0
Router1(dhcp-config)#default-router 10.99.1.254
Router1(dhcp-config)#lease 0 8
Router1(dhcp-config)#exit

Router(config)#ip dhcp pool vlan10
Router1(dhcp-config)#network 10.100.5.0 255.255.255.0
Router1(dhcp-config)#default-router 10.10.1.254
Router1(dhcp-config)#lease 0 8
Router1(dhcp-config)#exit

Router(config)#ip dhcp pool vlan20
Router1(dhcp-config)#network 10.200.5.0 255.255.255.0
Router1(dhcp-config)#default-router 10.20.1.254
Router1(dhcp-config)#lease 0 8
Router1(dhcp-config)#exit

Router(config)#ip dhcp pool vlan30
Router1(dhcp-config)#network 10.30.5.0 255.255.255.0
Router1(dhcp-config)#lease 0 8
Router1(dhcp-config)#exit
```

4.3.2 Configuração das Vlan's

```
S1#configure terminal
S1(config)#vlan 10
S1(config-vlan)#name funcionarios
S1(config-vlan)#end
S1(config)#vlan 20
S1(config-vlan)#name alunos
S1(config-vlan)#end

S1(config)#vlan 30
S1(config-vlan)#name guest
S1(config-vlan)#end

S1(config)#vlan 99
S1(config-vlan)#name gestao
S1(config-vlan)#end

S1#configure terminal
S1(config)#interface FastEthernet0/1
S1(config-if)#switchport mode trunk
S1(config-if)#switchport trunk allowed vlan 10,20,99
S1(config-if)#end

S1(config)#interface range FastEthernet0/2-8
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 10
S1(config-if)#exit

S1(config)# interface range FastEthernet0/9-16
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 20
S1(config-if)#exit

S1(config)#interface range FastEthernet0/17-23
S1(config-if)#switchport mode access
S1(config-if)#switchport access vlan 30
S1(config-if)#exit
```

4.4 Demonstração de pings

```
C:\Users\Calças>ping 10.100.5.254

Pinging 10.100.5.254 with 32 bytes of data:
Reply from 10.100.5.254: bytes=32 time=1ms TTL=255
Reply from 10.100.5.254: bytes=32 time=1ms TTL=255
Reply from 10.100.5.254: bytes=32 time=1ms TTL=255
Reply from 10.100.5.254: bytes=32 time=1ms TTL=255

Ping statistics for 10.100.5.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 1ms, Average = 1ms
```

Figura 2: Ping ao default router da rede alunos(PC na rede funcionario)

Figura 3: Ping ao default router(PC na rede funcionario)

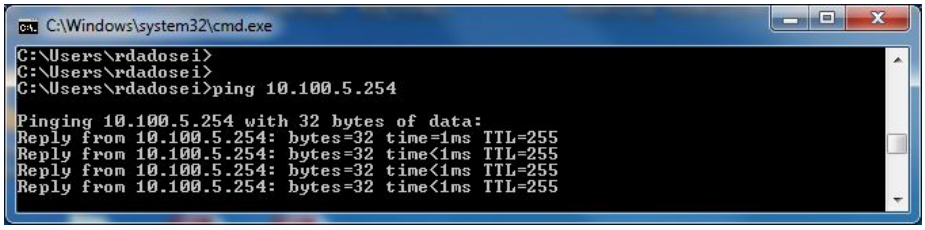

Figura 4: Ping ao Default GateWay da rede funcionarios(PC na rede alunos)

4.5 Demonstração das interfaces e de vlans atribuídas

```
Router1#show ip int brief
Interface                  IP-Address      OK? Method Status
                Prot
ocol
FastEthernet0/0            unassigned      YES manual up
                    up

FastEthernet0/0.10         10.100.5.254    YES manual up
                    up
```

```
FastEthernet0/0.20          10.200.5.254    YES manual up
                        up

FastEthernet0/0.30          10.30.5.254     YES manual up
                        up

FastEthernet0/0.99          10.99.5.254     YES manual up
                        up

FastEthernet0/1             192.168.1.5     YES manual up
                        up

Serial0/0/0                 unassigned      YES manual
    administratively down down

Serial0/0/1                 unassigned      YES manual
    administratively down down
```

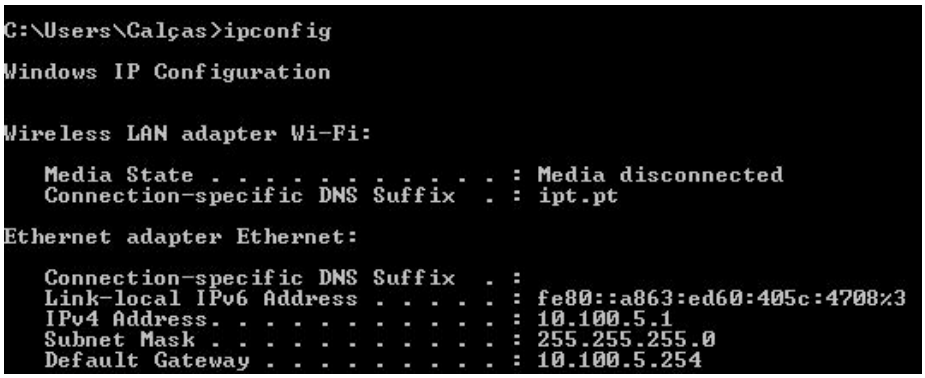

Figura 5: Exemplo de um vlan atribuida

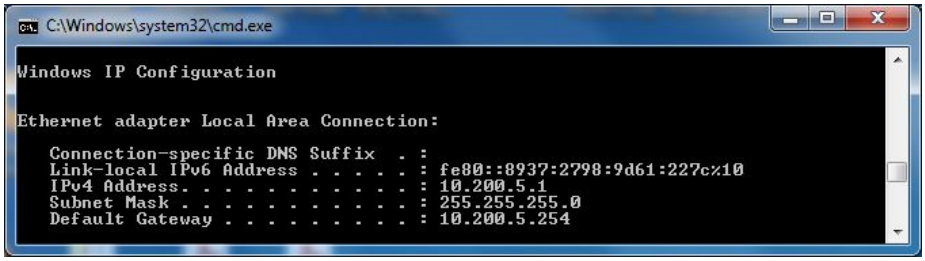

Figura 6: Mais um exemplo de um vlan atribuida

4.6 ACl's

```
Tarefa 5: Configure ACLs de acordo com os requisitos seguintes:

 Deve existir conectividade entre os dispositivos das redes
     funcionrios e alunos.
 router(config)#access-list 110 permit ip 10.100.5.0 0.0.0.255
     10.200.5.0 0.0.0.255
```

```
 router(config)#access-list 110 permit ip 10.200.5.0 0.0.0.255
     10.100.5.0 0.0.0.255

 Nao existe conectividade entre os dispositivos da rede guest e
     os dispositivos das
redes funcionrio e alunos.
 router(config)#access-list 110 deny ip 10.30.5.0 0.0.0.255
     10.100.5.0 0.0.0.255 -- Entre os dispositivos da rede
     Guest e rede Funcionarios
 router(config)#access-list 110 deny ip 10.30.5.0 0.0.0.255
     10.200.5.0 0.0.0.255 -- Entre os dispositivos da rede
     Guest e rede Alunos
 router(config)#access-list 110 deny ip 10.100.5.0 0.0.0.255
     10.30.5.0 0.0.0.255 -- Entre os dispositivos da rede
     Funcionarios e rede Guest
 router(config)#access-list 110 deny ip 10.200.5.0 0.0.0.255
     10.30.5.0 0.0.0.255 -- Entre os dispositivos da rede
     Alunos e rede Guest


 Apenas deve ser permitido aos dispositivos das rede de gestao
     o acesso remoto
aos dispositivos de rede.
 router(config)#access-list 110 permit ip 10.100.5.0 0.0.0.255
     10.200.5.0 0.0.0.255

 Apenas e suportado o protocolo de encaminhamento OSPF.
 router(config)#access-list 105 permit ospf any any


inteface fa 0/0.10
ip access-group 110 in
ip access-group 110 out
```

4.7 Show run do switch e do router

```
Router1#show running-config
Building configuration...

Current configuration : 2099 bytes
!
version 12.4
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname Router1
!
boot-start-marker
boot-end-marker
!
enable secret class
!
no aaa new-model
memory-size iomem 20
ip cef
!
!
no ip dhcp use vrf connected
!
```

```
ip dhcp pool poolFuncionario
   network 10.100.5.0 255.255.255.0
   default-router 10.100.5.254
!
ip dhcp pool poolAlunos
   network 10.200.5.0 255.255.255.0
   default-router 10.200.5.254
!
ip dhcp pool poolGuest
   network 10.30.5.0 255.255.255.0
   default-router 10.30.5.254
!
!
no ip domain lookup
!
multilink bundle-name authenticated
!
!
!
!
!
!
!
!
!
!
interface FastEthernet0/0
 no ip address
 duplex auto
 speed auto
!
interface FastEthernet0/0.10
 encapsulation dot1Q 10
 ip address 10.100.5.254 255.255.255.0
 ip access-group 110 in
 ip access-group 110 out
!
interface FastEthernet0/0.20
 encapsulation dot1Q 20
 ip address 10.200.5.254 255.255.255.0
 ip access-group 110 in
 ip access-group 110 out
!
interface FastEthernet0/0.30
 encapsulation dot1Q 30
 ip address 10.30.5.254 255.255.255.0
 ip access-group 110 in
 ip access-group 110 out
!
interface FastEthernet0/0.99
 encapsulation dot1Q 99
 ip address 10.99.5.254 255.255.255.0
!
interface FastEthernet0/1
 ip address 192.168.1.5 255.255.255.0
 duplex auto
 speed auto
!
interface Serial0/0/0
 no ip address
 shutdown
 no fair-queue
```

```
 clock rate 2000000
!
interface Serial0/0/1
 no ip address
 shutdown
 clock rate 2000000
!
router ospf 1
 log-adjacency-changes
 network 10.30.5.0 0.0.0.255 area 5
 network 10.100.5.0 0.0.0.255 area 5
 network 10.200.5.0 0.0.0.255 area 5
 network 192.168.1.0 0.0.0.255 area 0
!
!
!
ip http server
no ip http secure-server
!
access-list 105 permit ospf any any
access-list 110 permit udp 10.200.5.0 0.0.0.255 eq bootps any
    eq bootpc
access-list 110 permit udp 10.30.5.0 0.0.0.255 eq bootps any eq
    bootpc
!
!
!
!
!
!
control-plane
!
!
banner motd ^CCCHello Router 1^C
!
line con 0
 password class
 login
line aux 0
line vty 0 4
 password class
 login
!
scheduler allocate 20000 1000
end
```

```
S1#show running-config
Building configuration...

Current configuration : 2496 bytes
!
version 12.2
no service pad
service timestamps debug datetime msec
service timestamps log datetime msec
no service password-encryption
!
hostname S1
!
boot-start-marker
boot-end-marker
!
```

```
enable secret class
!
!
!
no aaa new-model
system mtu routing 1500
!
!
!
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
vlan internal allocation policy ascending
!
!
!
interface FastEthernet0/1
 switchport trunk allowed vlan 10,20,30,99
 switchport mode trunk
!
interface FastEthernet0/2
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/4
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/5
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/6
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/7
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/8
 switchport access vlan 10
 switchport mode access
!
interface FastEthernet0/9
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/10
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/11
```

```
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/12
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/13
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/14
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/15
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/16
 switchport access vlan 20
 switchport mode access
!
interface FastEthernet0/17
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/18
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/19
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/20
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/21
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/22
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/23
 switchport access vlan 30
 switchport mode access
!
interface FastEthernet0/24
 switchport access vlan 99
 switchport mode access
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
!
```

```
ip http server
ip http secure-server
!
line con 0
line vty 5 15
!
end
```