

PROJECTO DE REDES 2012 / 2013

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Abril de 2014

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1 Objectivos

Montagem da componente física de uma rede.
Configuração de equipamento activo.
Autenticação 802.1x.
Proxy Radius.
Debugging e troubleshooting.

2 Topologia

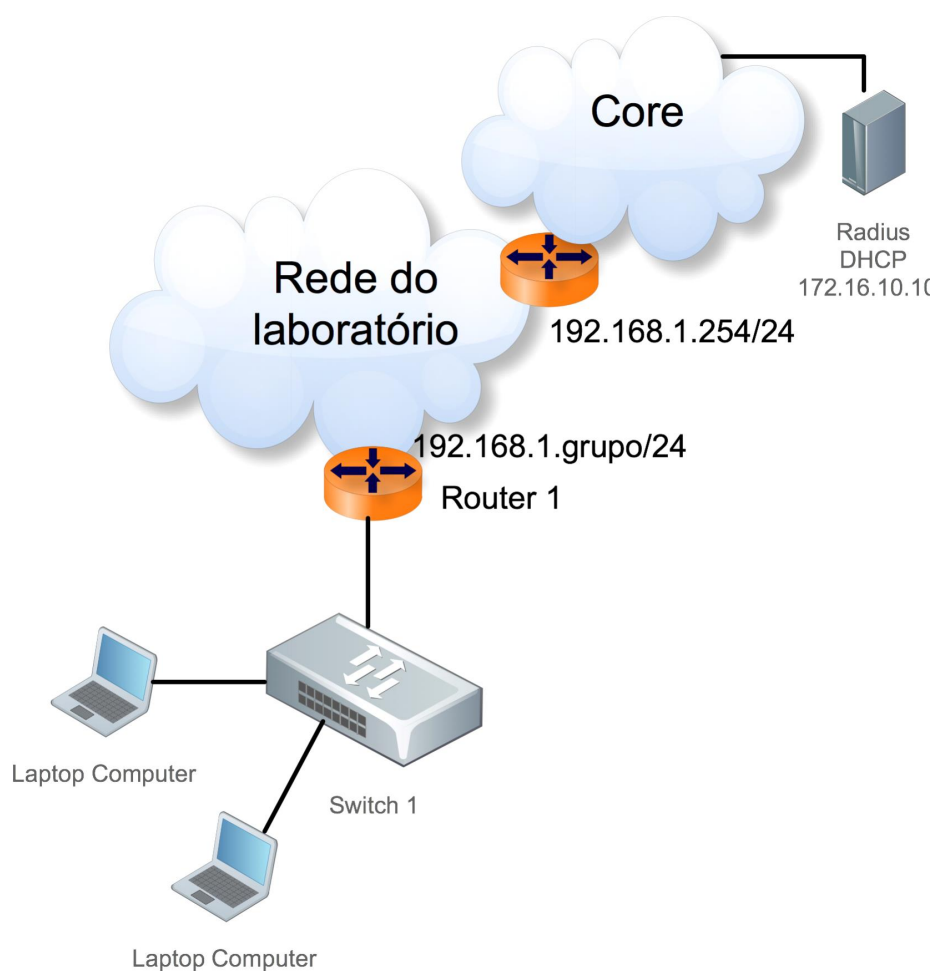


Figura 1: Topologia do trabalho

3 Tabela das Vlan

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:vlan.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 (host-name)
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 do Router e do Switch.

4.3.1 Configuração do Router

```
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
```

4.3.2 Configuração do Switch

```
S1(config)#interface range fastEthernet 0/1-24
```



```
!  
!  
!  
!  
interface FastEthernet0/0  
no ip address  
duplex auto  
speed auto  
!  
interface FastEthernet0/0.10  
encapsulation dot1Q 10  
ip address 10.10.5.254 255.255.255.0  
ip helper-address 172.16.10.10  
!  
interface FastEthernet0/0.20  
encapsulation dot1Q 20  
ip address 10.20.5.254 255.255.255.0  
ip helper-address 172.16.10.10  
!  
interface FastEthernet0/0.30  
encapsulation dot1Q 30  
ip address 10.30.5.254 255.255.255.0  
ip helper-address 172.16.10.10  
!  
interface FastEthernet0/0.99  
encapsulation dot1Q 99  
ip address 10.99.5.254 255.255.255.0  
ip helper-address 172.16.10.10  
!  
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 10.10.5.0 0.0.0.255 area 5  
network 10.20.5.0 0.0.0.255 area 5  
network 10.30.5.0 0.0.0.255 area 5  
network 10.99.5.0 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  
!  
!  
!  
!
```

```
!  
!  
control-plane  
!  
!  
banner motd ^CHello Router 1^C  
!  
line con 0  
  password class  
  login  
line aux 0  
line vty 0 4  
  password class  
  login  
!  
scheduler allocate 20000 1000  
end
```

4.4.2 Switch

```
Current configuration : 4677 bytes  
!  
version 12.2  
no service pad  
service timestamps debug datetime msec  
service timestamps log datetime msec  
no service password-encryption  
!  
hostname Switch  
!  
boot-start-marker  
boot-end-marker  
!  
enable secret class  
!  
!  
!  
aaa new-model  
!  
!  
aaa authentication dot1x default group radius  
aaa authorization network default group radius  
!  
!  
!  
aaa session-id common  
system mtu routing 1500  
!  
!  
!  
mls qos  
!  
!  
dot1x system-auth-control  
!  
!  
!  
spanning-tree mode pvst  
spanning-tree extend system-id  
!  
vlan internal allocation policy ascending
```



```
!  
!  
class-map match-all MAPA  
  match access-group 100  
class-map match-all student  
  match access-group 100  
!  
!  
policy-map MAPA  
  class MAPA  
    police 2000000 1000000 exceed-action drop  
policy-map Politica  
  class MAPA  
    police 2000000 1000000 exceed-action drop  
policy-map student-policy  
  class student  
    police 2000000 1000000 exceed-action drop  
policy-map qos  
!  
!  
!  
interface FastEthernet0/1  
  switchport trunk allowed vlan 1,10,20,30,99  
  switchport mode trunk  
!  
interface FastEthernet0/2  
  switchport mode access  
  authentication port-control auto  
  dot1x pae authenticator  
  service-policy input Politica  
!  
interface FastEthernet0/3  
  switchport mode access  
  authentication port-control auto  
  dot1x pae authenticator  
  service-policy input Politica  
!  
interface FastEthernet0/4  
  switchport mode access  
  authentication port-control auto  
  dot1x pae authenticator  
  service-policy input Politica  
!  
interface FastEthernet0/5  
  switchport mode access  
  authentication port-control auto  
  dot1x pae authenticator  
  service-policy input student-policy  
!  
interface FastEthernet0/6  
  switchport mode access  
  authentication port-control auto  
  dot1x pae authenticator  
  service-policy input Politica  
!  
interface FastEthernet0/7  
  switchport mode access  
  authentication port-control auto  
  dot1x pae authenticator  
  service-policy input Politica  
!  
interface FastEthernet0/8
```

```
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/9
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/10
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/11
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/12
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/13
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/14
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/15
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/16
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/17
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/18
switchport mode access
authentication port-control auto
```

```
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/19
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/20
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/21
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/22
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/23
switchport mode access
authentication port-control auto
dot1x pae authenticator
service-policy input Politica
!
interface FastEthernet0/24
switchport mode access
authentication port-control auto
dot1x pae authenticator
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
no ip address
shutdown
!
interface Vlan99
ip address 10.99.5.100 255.255.255.0
!
ip http server
ip http secure-server
access-list 100 permit ip 10.20.5.0 0.0.0.255 any
radius-server host 172.16.10.10 auth-port 1812 acct-port 1813
key password
!
line con 0
password class
line vty 0 4
password class
line vty 5 15
!
end
```

5 Demonstrações

5.1 Demonstração Radius



```

C:\Users\Calças>ipconfig

Windows IP Configuration

Wireless LAN adapter Wi-Fi:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  : : ipt.pt

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  : :
    Link-local IPv6 Address . . . . : fe80::a863:ed60:405c:4700%3
    IPv4 Address. . . . . : 10.20.5.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.20.5.254
  
```

Figura 2: Ip fornecido pelo servidor Radius

Demonstração do servidor radius a funcionar.

```

*Mar  1 02:00:47.522: %AUTHMGR-5-START: Starting 'dot1x' for
client (38ea.a7d9.2
6b3) on Interface Fa0/3 AuditSessionID 0A63056400000006006C73FF
*Mar  1 02:00:47.673: %DOT1X-5-SUCCESS: Authentication
successful for client (38
ea.a7d9.26b3) on Interface Fa0/3 AuditSessionID
*Mar  1 02:00:47.673: %AUTHMGR-7-RESULT: Authentication result
'success' from 'd
ot1x' for client (38ea.a7d9.26b3) on Interface Fa0/3
AuditSessionID 0A6305640000
0006006C73FF
*Mar  1 02:00:47.673: %AUTHMGR-5-VLANASSIGN: VLAN 20 assigned
to Interface Fa0/3
AuditSessionID 0A63056400000006006C73FF
*Mar  1 02:00:48.696: %LINEPROTO-5-UPDOWN: Line protocol on
Interface FastEthern
et0/3, changed state to up
*Mar  1 02:00:48.721: %AUTHMGR-5-SUCCESS: Authorization
succeeded for client (38
ea.a7d9.26b3) on Interface Fa0/3 AuditSessionID
0A63056400000006006C73FF
  
```

5.2 Ip's e Interfaces do ebits

5.2.1 Interface ebits

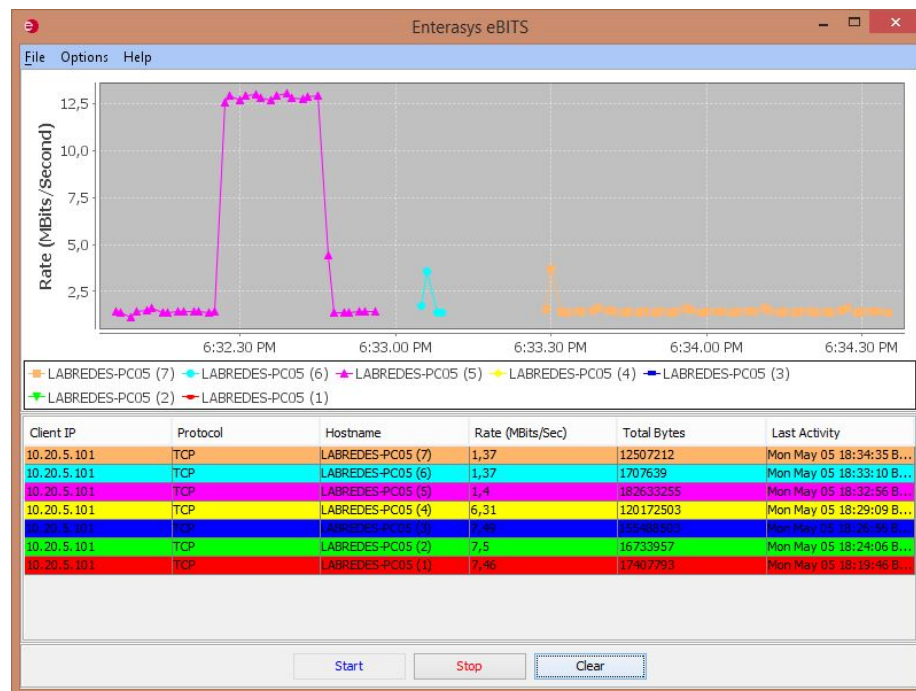


Figura 3: Servidor ebits a enviar pacotes

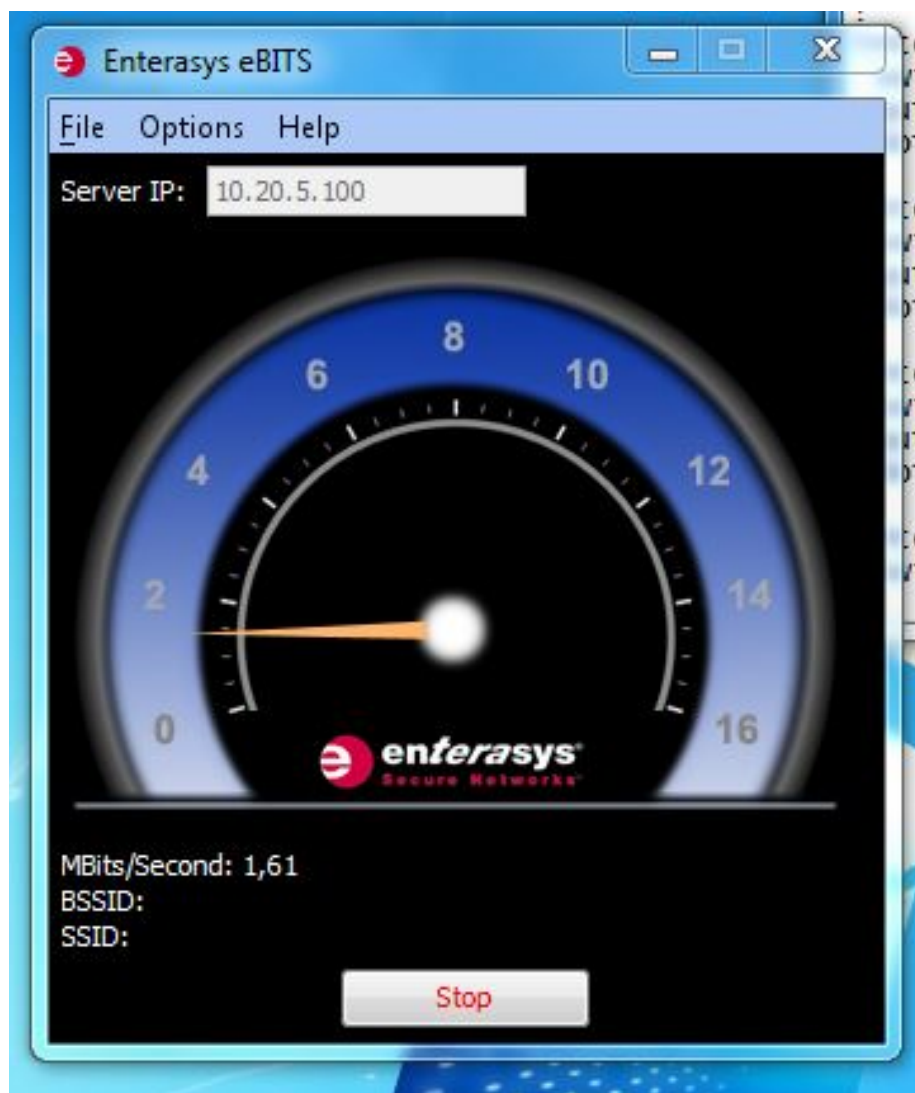
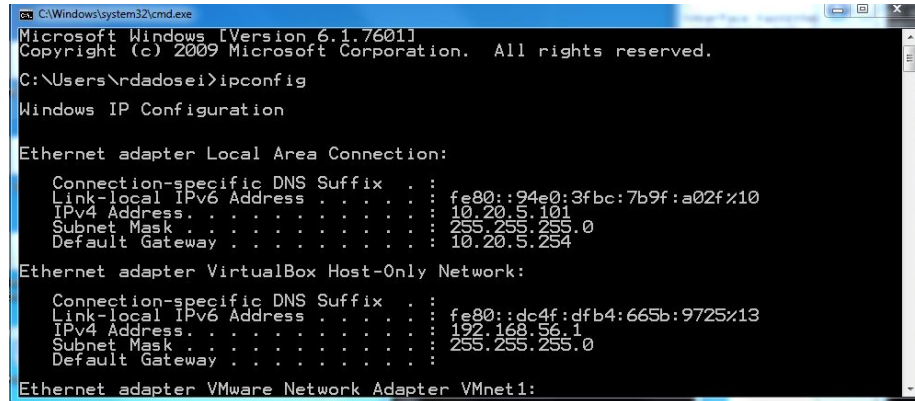


Figura 4: Rate limiting a funcionar

5.2.2 Ip cliente e servidor



```
C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\rdadosei>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::94e0:3fbc:7b9f:a02f%10
    IPv4 Address. . . . . : 10.20.5.101
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.20.5.254

Ethernet adapter VirtualBox Host-Only Network:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::dc4f:dfb4:665b:9725%13
    IPv4 Address. . . . . : 192.168.56.1
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

Ethernet adapter VMware Network Adapter VMnet1:
```

Figura 5: ip do cliente que irá usar o ebits



```
CA: Linha de comandos
Microsoft Windows [Version 6.3.9600]
(c) 2013 Microsoft Corporation. Todos os direitos reservados.

C:\Users\Calças>ipconfig

Windows IP Configuration

Wireless LAN adapter Wi-Fi:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . : ipt.pt

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::a863:ed60:405c:4700%3
    IPv4 Address. . . . . : 10.20.5.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.20.5.254

Ethernet adapter VirtualBox Host-Only Network:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::95b:be81:484a:720%26
```

Figura 6: ip do servidor que irá enviar os pacotes