IPS Instituto Politécnico de Setúbal

Escola Superior de Tecnologia de Setúbal

Redes de Computadores

Licenciatura em Engenharia Informática

Trabalho de Laboratório nº 5:

Configuração e Teste de Virtual Local Area Networks (VLANs) e Routing Inter-VLAN

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Ano Letivo 2020-2021

1. INTRODUÇÃO

O seguinte trabalho laboratorial destina-se à compreensão e colocação em prática dos conhecimentos e técnicas aprendidas sobre VLANs.

Durante a realização deste documento, foram utilizadas vários e distintos comandos de auxílio à configuração e manipulação de VLANs, acompanhados de perguntas sobre os diferentes estados dos componentes.

2. REALIZAÇÃO PRÁTICA (1 OU MAIS SECÇÕES)

2.1. CONFIGURAÇÃO DAS VLAN'S

Switch0# show vlan

```
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
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

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

Que portas pertencem à VLAN 1?

Da porta F0/1 até à F0/24.

Criação da VLAN 20:

```
Switch0(config)#vlan 20
Switch0(config-vlan)#name DRH
Switch0(config-vlan)#^Z
Switch0#
%SYS-5-CONFIG_I: Configured from console by console
```

Ctrl+F6 to exit CLI focus Copy Paste

Switch0# show vlan, depois das configurações:

```
Switch0#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/3, Fa0/4, Fa0/15, Fa0/16
                                                 Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                                 Fa0/21, Fa0/22, Fa0/23, Fa0/24
10   Contab                            active    Fa0/1, Fa0/5, Fa0/6, Fa0/7
                                                 Fa0/8, Fa0/9
20   DRH                               active    Fa0/2, Fa0/10, Fa0/11, Fa0/12
                                                 Fa0/13, Fa0/14
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
10   enet  100010     1500  -      -      -        -    -        0      0
20   enet  100020     1500  -      -      -        -    -        0      0
1002 fddi  101002     1500  -      -      -        -    -        0      0
1003 tr    101003     1500  -      -      -        -    -        0      0
 --More--
```

Registe as atribuições das portas às VLANs.

VLAN 10: portas F0/1 e de F0/5 até F0/9

VLAN 20: portas F0/2 e de F0/10 até F0/14

Configuração do Switch1:

```
Switch1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#vlan 10
Switch1(config-vlan)#name Contab
Switch1(config-vlan)#^Z
Switch1#
%SYS-5-CONFIG_I: Configured from console by console

Switch1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#vlan 20
Switch1(config-vlan)#name DRH
Switch1(config-vlan)#^Z
```

```
Switch1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#interface vlan 5
Switch1(config-if)#ip address 192.168.3.20 255.255.255.0
Switch1(config-if)#no shutdown
Switch1(config-if)#exit
Switch1(config)#ip default-gateway 192.168.3.1
Switch1(config)#
```

Portas F0/1 e F075 - 9 Vlan 10:

```
Switch1(config)#interface F0/1
Switch1(config-if)#switchport mode access
Switch1(config-if)#switchport access vlan 10
Switch1(config-if)#^Z
Switch1#
%SYS-5-CONFIG_I: Configured from console by console

Switch1#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#interface range fo/5 - 9
                               ^
% Invalid input detected at '^' marker.

Switch1(config)#interface range f0/5 - 9
Switch1(config-if-range)#switchport mode access
Switch1(config-if-range)#switchport access vlan 10
Switch1(config-if-range)#^Z
```

Portas F0/2 e F0/10 – 14 Vlan 20:

```
Switch1#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#interface f0/2
Switch1(config-if)#switchport mode access
Switch1(config-if)#switchport access vlan 20
Switch1(config-if)#^Z
Switch1#
%SYS-5-CONFIG_I: Configured from console by console

Switch1#conf
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Switch1(config)#interface range f0/10 - 14
Switch1(config-if-range)#switchport acc
Switch1(config-if-range)#switchport mode access
Switch1(config-if-range)#switchport access vlan 20
Switch1(config-if-range)#^Z
```

Swicth1# show vlan:

```
Switch1#show vlan

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

Ping Contab1 → Contab2

```
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Ping DRH1 → DRH2

```
C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Ping Contab1 → DRH1

```
C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Não é possivel comunicar entre os PC's.

Após configuração da porta F0/24:

```
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time=1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Reply from 192.168.2.20: bytes=32 time=1ms TTL=128
Reply from 192.168.2.20: bytes=32 time<1ms TTL=128
Reply from 192.168.2.20: bytes=32 time<1ms TTL=128
Reply from 192.168.2.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

```
C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

2.2. CONFIGURAÇÃO DO ROUTER

Ping DRH1 → DRH3

```
C:\>ping 192.168.2.30

Pinging 192.168.2.30 with 32 bytes of data:

Reply from 192.168.2.30: bytes=32 time<1ms TTL=128
Reply from 192.168.2.30: bytes=32 time=1ms TTL=128
Reply from 192.168.2.30: bytes=32 time<1ms TTL=128
Reply from 192.168.2.30: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Ping Contab1 → Gateway por omissão

```
C:\>ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:

Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time<1ms TTL=255
Reply from 192.168.1.1: bytes=32 time=1ms TTL=255

Ping statistics for 192.168.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Ping bem sucedido.

Contab1 → Contab2

```
C:\>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128
Reply from 192.168.1.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping sucedido.

DRH1 → DRH2

```
C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Reply from 192.168.2.20: bytes=32 time<1ms TTL=128
Reply from 192.168.2.20: bytes=32 time<1ms TTL=128
Reply from 192.168.2.20: bytes=32 time<1ms TTL=128
Reply from 192.168.2.20: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping bem sucedido.

DRH2 → DRH3

```
C:\>ping 192.168.2.30

Pinging 192.168.2.30 with 32 bytes of data:

Reply from 192.168.2.30: bytes=32 time=1ms TTL=128
Reply from 192.168.2.30: bytes=32 time<1ms TTL=128
Reply from 192.168.2.30: bytes=32 time=1ms TTL=128
Reply from 192.168.2.30: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.2.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Ping bem sucedido.

Contab1 → DRH1

```
C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time<1ms TTL=127
Reply from 192.168.2.20: bytes=32 time=10ms TTL=127

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 3ms
```

Foram recebidos 3 packets das 4 enviadas.

Contab1 → Switch0

```
C:\>ping 192.168.3.20

Pinging 192.168.3.20 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.3.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

O ping não foi bem sucedido, falhando a comunicação entre o PC Contab1 e o IP de gestão do Switch0.

2.3. COMANDOS

Comandos	Descrição
Show vlan	Mostra as VLAN's existentes no switch em questão.
Vlan 5	Cria uma vlan 5.
Name	Muda o nome de uma vlan
Interface vlan 5	Entra no modo de configuração da interface.
Switchport mode access	Serve para colocar a interface em modo de acesso
Switchport mode trunk	Coloca a interface em modo de entroncamento.
Encapsulation dot1q 10	Habilita o encapsulamento de trafego na interface especificada.

3. CONCLUSÕES

Este foi o laboratório mais complicado de resolver. No geral foi entendido o propódito do mesmo, adquirindo o conhecimento de inicialização e configuração das VLAN's. Existiram alguns erros, principalmente no final do enunciado, 4.1, onde os pings entre um PC e o IP de um switch não estava a funcionar, de resto este laboratório está completo de acordo com o enunciado.