Университет ИТМО

Факультет программной инженерии и компьютерной техники
Направление подготовки 09.03.04 Программная инженерия
Дисциплина «Администрирование систем и сетей»

Отчет

По лабораторной работе №3
Вариант на 3

Выполнили:
Митрофанов Е. Ю.
Любкин А. С.

Преподаватель:
Афанасьев Д. Б.

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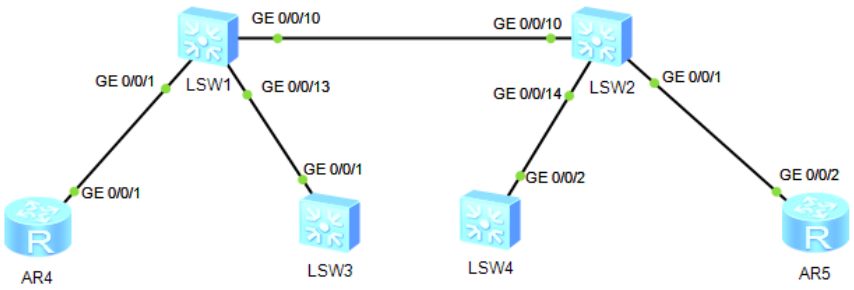
Оглавление

Цель работы

Получить практические навыки в следующих темах:

- Создание VLAN
- Конфигурирование портов доступа, магистральных портов и гибридных портов
- Конфигурирование VLAN на основе портов
- Конфигурирование VLAN на основе MAC-адресов
- Просмотр таблицы MAC-адресов и информации о VLAN

Топология сети



План работы

1. Создание VLAN
2. Конфигурирование VLAN на основе портов
3. Конфигурирование VLAN на основе MAC – адресов

Конфигурация оборудования

Настройка IP – адресов для устройств

```
[R1-GigabitEthernet0/0/1] ip address 10.1.2.1 24
[R1-GigabitEthernet0/0/1]
Oct 18 2022 03:07:35-08:00 R1 %%01IFNET/4/LINK_STATE(l)[0]:The line
protocol IP
on the interface GigabitEthernet0/0/1 has entered the UP state.
[R2-GigabitEthernet0/0/2]ip address 10.1.10.1 24
```

```
Oct 18 2022 03:09:04-08:00 R2 %%01IFNET/4/LINK_STATE(l)[0]:The line
protocol IP
on the interface GigabitEthernet0/0/2 has entered the UP state.
```

Установка для VLANIf3 на S3 и S4

```
[S3] vlan 3
[S3-vlan3]
Oct 17 2022 22:12:04-08:00 S3 DS/4/DATASYNC_CFGCHANGE:OID
1.3.6.1.4.1.2011.5.25.
191.3.1 configurations have been changed. The current change number is 5,
the ch
ange loop count is 0, and the maximum number of records is 4095.
[S4]vlan 3
[S4-vlan3]
Oct 17 2022 22:12:20-08:00 S4 DS/4/DATASYNC_CFGCHANGE:OID
1.3.6.1.4.1.2011.5.25.
191.3.1 configurations have been changed. The current change number is 5,
the change loop count is 0, and the maximum number of records is 4095.
[S3-GigabitEthernet0/0/1] port link-type access
[S3-GigabitEthernet0/0/1]
Oct 17 2022 22:14:04-08:00 S3 DS/4/DATASYNC_CFGCHANGE:OID
1.3.6.1.4.1.2011.5.25.
191.3.1 configurations have been changed. The current change number is 6,
the ch
ange loop count is 0, and the maximum number of records is 4095.
[S3-GigabitEthernet0/0/1] port default vlan 3
[S3-GigabitEthernet0/0/1]
Oct 17 2022 22:14:17-08:00 S3 %%01IFNET/4/IF_STATE(l)[1]:Interface Vlanif1
has t
urned into DOWN state.
[S4-GigabitEthernet0/0/2] port link-type access
[S4-GigabitEthernet0/0/2] port default vlan 3
Oct 17 2022 22:16:34-08:00 S4 %%01IFNET/4/IF_STATE(l)[1]:Interface Vlanif1
has t
urned into DOWN state.

[S3] interface Vlanif 3
[S3-Vlanif3]
Oct 17 2022 22:17:43-08:00 S3 %%01IFNET/4/IF_STATE(l)[2]:Interface Vlanif3
has t
urned into UP state.
[S3-Vlanif3] ip address 10.1.3.1 24
[S3-Vlanif3]
```

```
Oct 17 2022 22:17:59-08:00 S3 %%01IFNET/4/LINK_STATE(l)[3]:The line
protocol IP
on the interface Vlanif3 has entered the UP state.
[S4] interface Vlanif 3
[S4-Vlanif3]
Oct 17 2022 22:18:28-08:00 S4 %%01IFNET/4/IF_STATE(l)[2]:Interface Vlanif3
has t
urned into UP state.
[S4-Vlanif3] ip ad
[S4-Vlanif3] ip address 10.1.3.2 24
[S4-Vlanif3]
Oct 17 2022 22:18:41-08:00 S4 %%01IFNET/4/LINK_STATE(l)[3]:The line
protocol IP
on the interface Vlanif3 has entered the UP state.
```

Создание VLAN 2,3 и 10 на S1 и S2

```
[S1] vlan batch 2 to 3 10
Info: This operation may take a few seconds. Please wait for a
moment...done.
[S2] vlan batch 2 to 3 10
Info: This operation may take a few seconds. Please wait for a
moment...done.
```

Настройка сети VLAN на основе портов

```
[S1-GigabitEthernet0/0/1] port link-type access
[S1-GigabitEthernet0/0/1] port default vlan 2

[S1-GigabitEthernet0/0/13] port link-type access
[S1-GigabitEthernet0/0/13] port default vlan 3

[S1-GigabitEthernet0/0/13] port link-type access
[S1-GigabitEthernet0/0/13] port default vlan 2

[S2-GigabitEthernet0/0/14] port link-type access
[S2-GigabitEthernet0/0/14] port default vlan 3
```

Настройка портов, соединяющих S1 и S2 только для пакетов из VLAN2 и VLAN3

```
[S1-GigabitEthernet0/0/10] port link-type trunk
[S1-GigabitEthernet0/0/10] port trunk allow-pass vlan 2 3
[S1-GigabitEthernet0/0/10] undo port trunk allow-pass vlan 1

[S2-GigabitEthernet0/0/10] port link-type trunk
[S2-GigabitEthernet0/0/10] port trunk allow-pass vlan 2 3
[S2-GigabitEthernet0/0/10] undo port trunk allow-pass vlan 1
```

Конфигурация сети VLAN на основе MAC адресов

```
[S2-vlan10]mac-vlan mac-address 00e0-fc28-2218

[S2-GigabitEthernet0/0/1] port link-type hybrid
[S2-GigabitEthernet0/0/1] port hybrid untagged vlan 10

[S2-GigabitEthernet0/0/2] port link-type hybrid
[S2-GigabitEthernet0/0/2] port hybrid untagged vlan 10

[S2-GigabitEthernet0/0/3] port link-type hybrid
[S2-GigabitEthernet0/0/3] port hybrid untagged vlan 10
```

Настройка на портах, соединяющих S1 и S2, разрешение для VLAN 10

```
[S1-GigabitEthernet0/0/10] port trunk allow-pass vlan 10
[S2-GigabitEthernet0/0/10] port trunk allow-pass vlan 10

[S2-GigabitEthernet0/0/1]mac-vlan enable
Info: This operation may take a few seconds. Please wait for a
moment...done
[S2-GigabitEthernet0/0/2]mac-vlan enable
Info: This operation may take a few seconds. Please wait for a
moment...done.
[S2-GigabitEthernet0/0/3]mac-vlan enable
Info: This operation may take a few seconds. Please wait for a
moment...done.
```

Информация р конфигурации

Информация о VLAN на коммутаторе

```
[S1]display vlan
The total number of vlans is : 4
--------------------------------------------------------------------------------
U: Up;         D: Down;         TG: Tagged;         UT: Untagged;
MP: Vlan-mapping;               ST: Vlan-stacking;
#: ProtocolTransparent-vlan;    *: Management-vlan;
--------------------------------------------------------------------------------

VID  Type    Ports
--------------------------------------------------------------------------------
1    common  UT:GE0/0/2(D)      GE0/0/3(D)      GE0/0/4(D)      GE0/0/5(D)
                GE0/0/6(D)      GE0/0/7(D)      GE0/0/8(D)      GE0/0/9(D)
                GE0/0/11(D)     GE0/0/12(D)     GE0/0/14(D)     GE0/0/15(D)
                GE0/0/16(D)     GE0/0/17(D)     GE0/0/18(D)     GE0/0/19(D)
                GE0/0/20(D)     GE0/0/21(D)     GE0/0/22(D)     GE0/0/23(D)
                GE0/0/24(D)

2    common  UT:GE0/0/1(U)
             TG:GE0/0/10(U)
3    common  UT:GE0/0/13(U)
             TG:GE0/0/10(U)

10   common  TG:GE0/0/10(U)


VID  Status  Property      MAC-LRN Statistics Description
--------------------------------------------------------------------------------

1    enable  default       enable  disable    VLAN 0001
2    enable  default       enable  disable    VLAN 0002
3    enable  default       enable  disable    VLAN 0003
10   enable  default       enable  disable    VLAN 0010



[S2]display vlan
The total number of vlans is : 4
--------------------------------------------------------------------------------
U: Up;         D: Down;         TG: Tagged;         UT: Untagged;
MP: Vlan-mapping;               ST: Vlan-stacking;
#: ProtocolTransparent-vlan;    *: Management-vlan;
--------------------------------------------------------------------------------
```

```
VID  Type    Ports
--------------------------------------------------------------------------------
1    common  UT:GE0/0/1(U)      GE0/0/2(D)      GE0/0/3(D)      GE0/0/4(D)
                GE0/0/5(D)      GE0/0/6(D)      GE0/0/7(D)      GE0/0/8(D)
                GE0/0/9(D)      GE0/0/11(D)     GE0/0/12(D)     GE0/0/13(D)
                GE0/0/15(D)     GE0/0/16(D)     GE0/0/17(D)     GE0/0/18(D)
                GE0/0/19(D)     GE0/0/20(D)     GE0/0/21(D)     GE0/0/22(D)
                GE0/0/23(D)     GE0/0/24(D)

2    common  TG:GE0/0/10(U)
3    common  UT:GE0/0/14(U)
             TG:GE0/0/10(U)

10   common  UT:GE0/0/1(U)      GE0/0/2(D)      GE0/0/3(D)
             TG:GE0/0/10(U)


VID  Status  Property      MAC-LRN Statistics Description
--------------------------------------------------------------------------------

1    enable  default       enable  disable    VLAN 0001
2    enable  default       enable  disable    VLAN 0002
3    enable  default       enable  disable    VLAN 0003
10   enable  default       enable  disable    VLAN 0010
```

Информация назначении VLAN на основе MAC - адресов на коммутаторе

```
[S2]display mac-vlan vlan 10
--------------------------------------------------
MAC Address     MASK            VLAN    Priority
--------------------------------------------------
00e0-fc28-2218  ffff-ffff-ffff  10      0

Total MAC VLAN address count: 1
```

Проверка конфигурации

```
<S4>ping 10.1.3.1
  PING 10.1.3.1: 56  data bytes, press CTRL_C to break
    Reply from 10.1.3.1: bytes=56 Sequence=1 ttl=255 time=110 ms
    Reply from 10.1.3.1: bytes=56 Sequence=2 ttl=255 time=80 ms
    Reply from 10.1.3.1: bytes=56 Sequence=3 ttl=255 time=80 ms
    Reply from 10.1.3.1: bytes=56 Sequence=4 ttl=255 time=110 ms
    Reply from 10.1.3.1: bytes=56 Sequence=5 ttl=255 time=80 ms
```

```
  --- 10.1.3.1 ping statistics ---
    5 packet(s) transmitted
    5 packet(s) received
    0.00% packet loss
    round-trip min/avg/max = 80/92/110 ms

<R1>ping 10.1.3.1
  PING 10.1.3.1: 56  data bytes, press CTRL_C to break
    Request time out
    Request time out
    Request time out
    Request time out
    Request time out

  --- 10.1.3.1 ping statistics ---
    5 packet(s) transmitted
    0 packet(s) received
    100.00% packet loss

[S1]display mac-address verbose

MAC address table of slot 0:
-------------------------------------------------------------------------------
MAC Address    VLAN/       PEVLAN CEVLAN Port            Type      LSP/LSR-ID
               VSI/SI                                              MAC-Tunnel
-------------------------------------------------------------------------------
4c1f-ccd3-5223 3           -      -      GE0/0/13        dynamic   0/-
4c1f-cc93-29cc 3           -      -      GE0/0/10        dynamic   0/-
-------------------------------------------------------------------------------
Total matching items on slot 0 displayed = 2


[S2]display mac-address verbose
MAC address table of slot 0:
-------------------------------------------------------------------------------
-----
MAC Address    VLAN/       PEVLAN CEVLAN Port            Type
LSP/LSR-ID
               VSI/SI                                                  MAC-
Tunnel
-------------------------------------------------------------------------------
-----
4c1f-ccd3-5223 3           -      -      GE0/0/10        dynamic   0/-
4c1f-cc93-29cc 3           -      -      GE0/0/14        dynamic   0/-
-------------------------------------------------------------------------------
-----
Total matching items on slot 0 displayed = 2
```

Вывод

Во время выполнения лабораторной работы мы углубили свои знания в симуляторе eNSP, а именно создали VLAN сеть и сконфигурировали ее, настроив на основе портов и MAC-адресов, а также просмотрели таблицы MAC – адресов и информацию о VLAN.