Презентация по лабораторной работе №9

Дисциплина: Администрирование локальных сетей

Лобанова П.И.

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Российский университет дружбы народов, Москва, Россия

Информация

Докладчик

- Лобанова Полина Иннокентьевна
- Учащаяся на направлении “Фундаментальная информатика и информационные технологии”
- Студентка группы НФИбд-02-22
- polla-2004@mail.ru

Цель

Цель

Изучение возможностей протокола STP и его модификаций по обеспечению отказоустойчивости сети, агрегированию интерфейсов и перераспределению нагрузки между ними.

Задание

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1. Сформируйте резервное соединение между коммутаторами msk-donskayasw-1 и msk-donskaya-sw-3.
2. Настройте балансировку нагрузки между резервными соединениями.
3. Настройте режим Portfast на тех интерфейсах коммутаторов, к которым подключены серверы.
4. Изучите отказоустойчивость резервного соединения.
5. Сформируйте и настройте агрегированное соединение интерфейсов Fa0/20 – Fa0/23 между коммутаторами msk-donskaya-sw-1 и msk-donskaya-sw-4.
6. При выполнении работы необходимо учитывать соглашение об именовании.

Выполнение

Выполнение

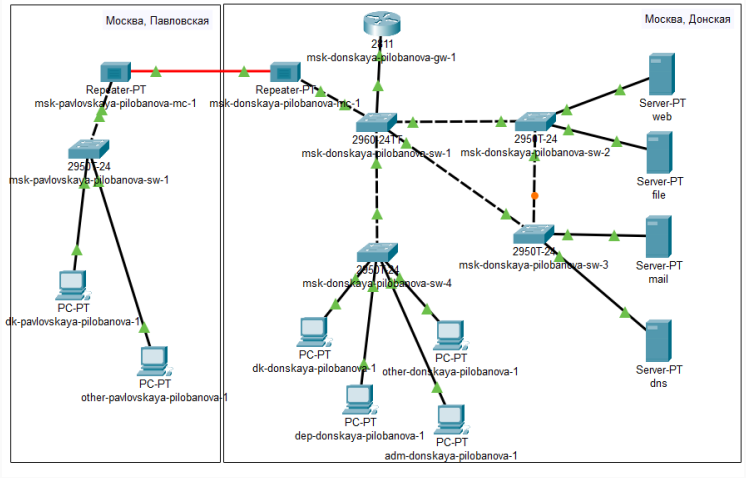

Рис. 1: *Логическая схема локальной сети с резервным соединением*

```
msk-donskaya-pilobanova-sw-3>en
Password:
msk-donskaya-pilobanova-sw-3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-sw-3(config)#int g0/2
msk-donskaya-pilobanova-sw-3(config-if)#switchport mode trunk
msk-donskaya-pilobanova-sw-3(config-if)#exit
```

Рис. 2: *Активация портов в транковом режиме*

```
msk-donskaya-pilobanova-sw-1>en
Password:
msk-donskaya-pilobanova-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-sw-1(config)#int f0/23
msk-donskaya-pilobanova-sw-1(config-if)#switchport mode trunk
```

Рис. 3: *Активация портов в транковом режиме*

```
msk-donskaya-pilobanova-sw-4>en
Password:
msk-donskaya-pilobanova-sw-4#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-sw-4(config)#int f0/23
msk-donskaya-pilobanova-sw-4(config-if)#swi
msk-donskaya-pilobanova-sw-4(config-if)#switchport mode trunk
```

Рис. 4: *Активация портов в транковом режиме*

```
C:\>ping www.donskaya.rudn.ru

Pinging 10.128.0.2 with 32 bytes of data:

Reply from 10.128.0.2: bytes=32 time=1ms TTL=127
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127
Reply from 10.128.0.2: bytes=32 time=1ms TTL=127
Reply from 10.128.0.2: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping mail.donskaya.rudn.ru

Pinging 10.128.0.4 with 32 bytes of data:

Request timed out.
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127

Ping statistics for 10.128.0.4:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Рис. 5: *Пингование*

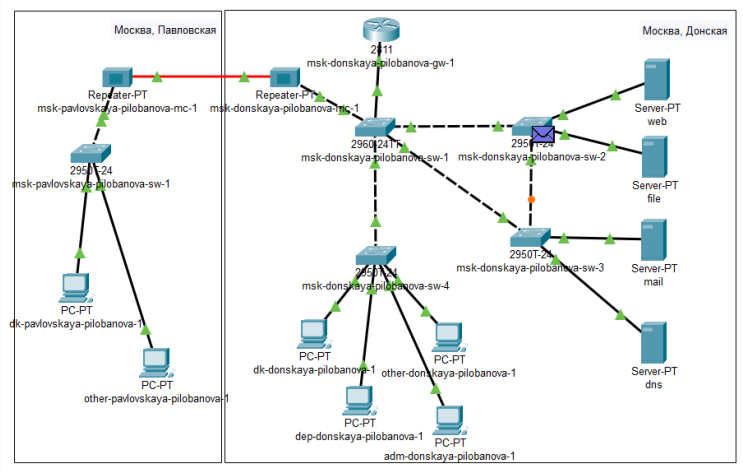

Рис. 6: *Режим симуляции*

На коммутаторе msk-donskaya-sw-2 посмотрела состояние протокола STP для vlan 3.

```
msk-donskaya-pilobanova-sw-2#show spanning-tree vlan 3
VLAN0003
  Spanning tree enabled protocol ieee
  Root ID     Priority    32771
              Address     0050.0F04.BDBB
              Cost        23
              Port        25(GigabitEthernet0/1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32771  (priority 32768 sys-id-ext 3)
              Address     00D0.D335.2CCB
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/2            Desg FWD 19        128.2    P2p
Fa0/1            Desg FWD 19        128.1    P2p
Gi0/1            Root FWD 4         128.25   P2p
Gi0/2            Desg FWD 4         128.26   P2p
```

Рис. 7: *Информация, связанная с протоколом STP*

```
msk-donskaya-pilobanova-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-sw-1(config)#spanning-tree vlan 3 root primary
msk-donskaya-pilobanova-sw-1(config)#
```

Рис. 8: *Настройка корневого коммутатаора*

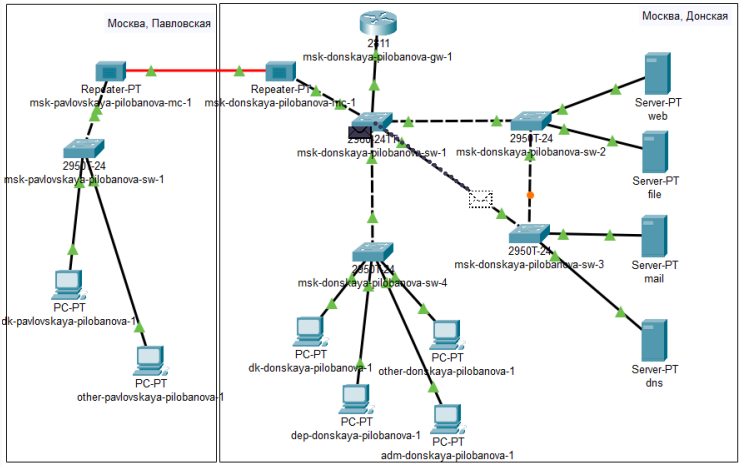

Рис. 9: *Режим симуляции*

```
msk-donskaya-pilobanova-sw-2(config)#int f0/1
msk-donskaya-pilobanova-sw-2(config-if)#spa
msk-donskaya-pilobanova-sw-2(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface  when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

%Portfast has been configured on FastEthernet0/1 but will only
have effect when the interface is in a non-trunking mode.
msk-donskaya-pilobanova-sw-2(config-if)#int f0/2
msk-donskaya-pilobanova-sw-2(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface  when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION
```

Рис. 10: *Настройка режима Portfast*

```
msk-donskaya-pilobanova-sw-3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-sw-3(config)#int f0/1
msk-donskaya-pilobanova-sw-3(config-if)#sp
msk-donskaya-pilobanova-sw-3(config-if)#spa
msk-donskaya-pilobanova-sw-3(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface  when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION

%Portfast has been configured on FastEthernet0/1 but will only
have effect when the interface is in a non-trunking mode.
msk-donskaya-pilobanova-sw-3(config-if)#int f0/2
msk-donskaya-pilobanova-sw-3(config-if)#spanning-tree portfast
%Warning: portfast should only be enabled on ports connected to a single
host. Connecting hubs, concentrators, switches, bridges, etc... to this
interface  when portfast is enabled, can cause temporary bridging loops.
Use with CAUTION
```

Рис. 11: *Настройка режима Portfast*

```
C:\>ping -n 1000 mail.donskaya.rudn.ru

Pinging 10.128.0.4 with 32 bytes of data:

Reply from 10.128.0.4: bytes=32 time=1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
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Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time=1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time=1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 10.128.0.4: bytes=32 time<1ms TTL=127
```

Рис. 12: *Пингование*

Переключила коммутаторы режим работы по протоколу Rapid PVST+.

```
msk-donskaya-pilobanova-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-pilobanova-sw-1(config)#spanning-tree mode ra
msk-donskaya-pilobanova-sw-1(config)#spanning-tree mode rapid-pvst
msk-donskaya-pilobanova-sw-1(config)#
```

Рис. 13: *Режим работы по протоколу Rapid PVST+*

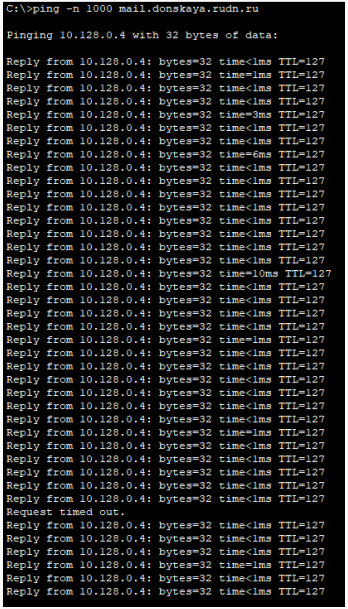

Рис. 14: *Пингование*

Сформировала агрегированное соединение интерфейсов Fa0/20 – Fa0/23 между коммутаторами msk-donskaya-sw-1 и msk-donskaya-sw-4.

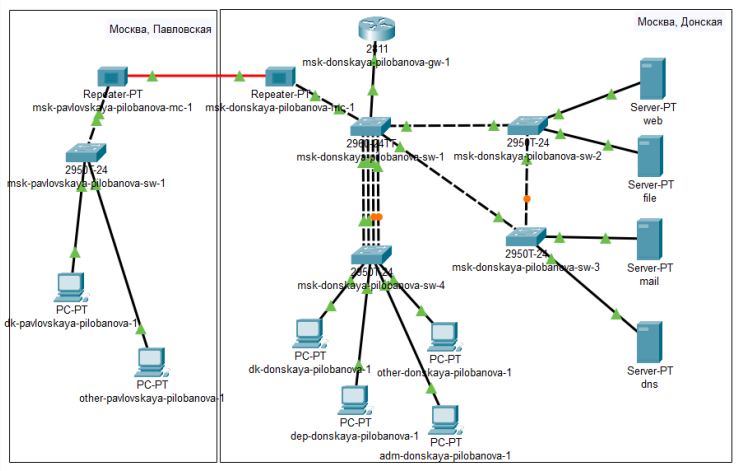

Рис. 15: *Логическая схема локальной сети с агрегированным соединением*

```
msk-donskaya-pilobanova-sw-1(config)#interface range f0/20 - 23
msk-donskaya-pilobanova-sw-1(config-if-range)#channel-group 1 mode on
msk-donskaya-pilobanova-sw-1(config-if-range)#
%EC-5-CANNOT_BUNDLE2: Fa0/20 is not compatible with Fa0/23 and will be suspended (dtp mode of
Fa0/20 is off, Fa0/23is on)

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/20, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/21 is not compatible with Fa0/23 and will be suspended (dtp mode of
Fa0/21 is off, Fa0/23is on)

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/21, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/22 is not compatible with Fa0/23 and will be suspended (dtp mode of
Fa0/22 is off, Fa0/23is on)

%EC-5-CANNOT_BUNDLE2: Fa0/20 is not compatible with Fa0/23 and will be suspended (dtp mode of
Fa0/20 is off, Fa0/23is on)

%EC-5-CANNOT_BUNDLE2: Fa0/21 is not compatible with Fa0/23 and will be suspended (dtp mode of
Fa0/21 is off, Fa0/23is on)

%EC-5-CANNOT_BUNDLE2: Fa0/23 is not compatible with Fa0/20 and will be suspended (dtp mode of
Fa0/23 is on, Fa0/20is off )

%EC-5-CANNOT_BUNDLE2: Fa0/23 is not compatible with Fa0/21 and will be suspended (dtp mode of
Fa0/23 is on, Fa0/2lis off )

%EC-5-CANNOT_BUNDLE2: Fa0/23 is not compatible with Fa0/22 and will be suspended (dtp mode of
Fa0/23 is on, Fa0/22is off )

%LINK-3-UPDOWN: Interface Port-channel1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Port-channel1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/22, changed state to down

%EC-5-CANNOT_BUNDLE2: Fa0/23 is not compatible with Fa0/20 and will be suspended (dtp mode of
Fa0/23 is on, Fa0/20is off )

%EC-5-CANNOT_BUNDLE2: Fa0/23 is not compatible with Fa0/21 and will be suspended (dtp mode of
Fa0/23 is on, Fa0/2lis off )

%EC-5-CANNOT_BUNDLE2: Fa0/23 is not compatible with Fa0/22 and will be suspended (dtp mode of
Fa0/23 is on, Fa0/22is off )

msk-donskaya-pilobanova-sw-1(config-if-range)#exit
msk-donskaya-pilobanova-sw-1(config)#interface port-channel 1
msk-donskaya-pilobanova-sw-1(config-if)#switchport mode trunk
msk-donskaya-pilobanova-sw-1(config-if)#
```

Рис. 16: *Настройка агрегирования каналов*

Вывод

Вывод

Я изучила возможности протокола STP и его модификаций по обеспечению отказоустойчивости сети, агрегированию интерфейсов и перераспределению нагрузки между ними.