Лабораторная работа №9

Администрирование локальных сетей

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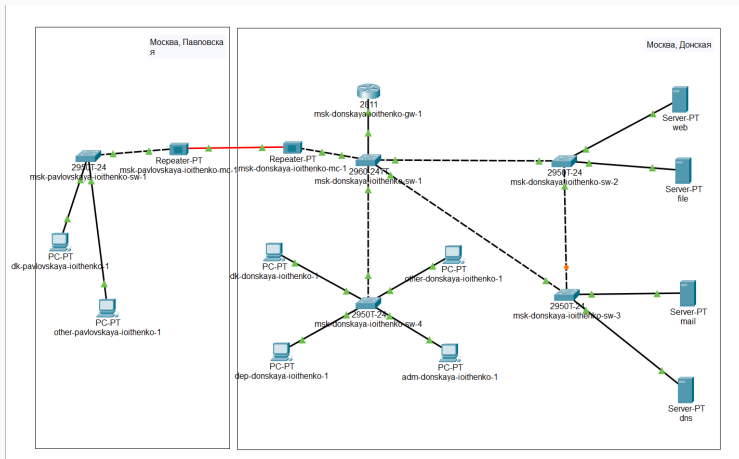
Выполнение лабораторной работы

Рис. 1: Соединения

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

Рис. 2: Транковый порт

Рис. 3: Пинг
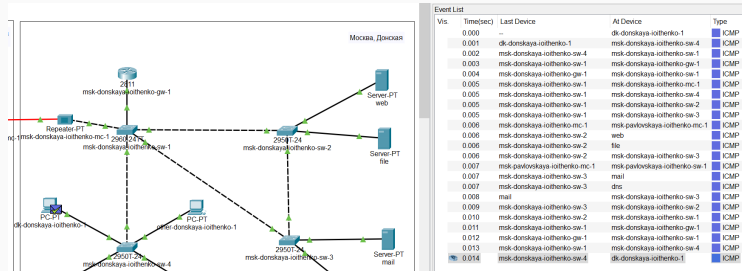
Рис. 4: Отправление пакетов

Рис. 5: Отправление пакетов

```
msk-donskaya-ioithenko-sw-2#show spanning-tree vlan 3
VLAN0003
  Spanning tree enabled protocol ieee
  Root ID     Priority    24579
              Address     0090.21CC.DDC4
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID  Priority    24579  (priority 24576 sys-id-ext 3)
              Address     0090.21CC.DDC4
              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            Desg FWD 4         128.25   P2p
Gi0/2            Desg FWD 4         128.26   P2p

msk-donskaya-ioithenko-sw-2#
```

Рис. 6: Состояние STP

```
msk-donskaya-ioithenko-sw-1>enable
Password:
msk-donskaya-ioithenko-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-sw-1(config)#spanning-tree vlan 3 root primary
msk-donskaya-ioithenko-sw-1(config)#
```
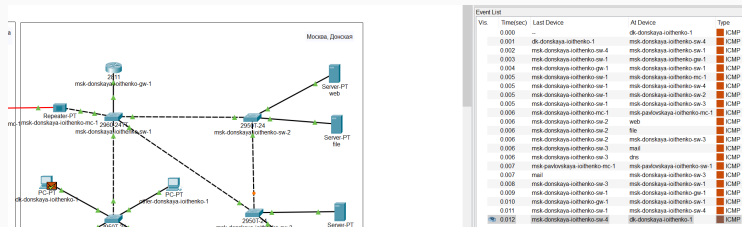
Рис. 7: Настройка коммутатора как корневого
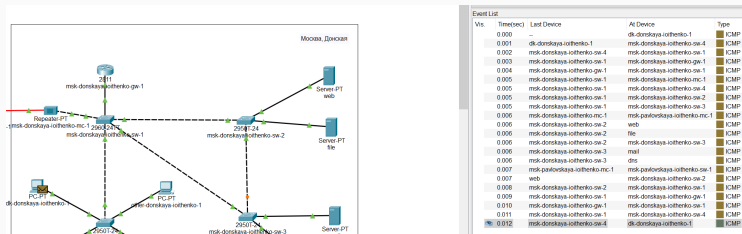
Рис. 8: Отправление пакета

Рис. 9: Отправление пакета

```
msk-donskaya-ioithenko-sw-2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-sw-2(config)#int f0/1
msk-donskaya-ioithenko-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-ioithenko-sw-2(config-if)#int f0/2
msk-donskaya-ioithenko-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 FastEthernet0/2 but will only
have effect when the interface is in a non-trunking mode.
msk-donskaya-ioithenko-sw-2(config-if)#exit
msk-donskaya-ioithenko-sw-2(config)#exit
msk-donskaya-ioithenko-sw-2#
%SYS-5-CONFIG_I: Configured from console by console
wr m
Building configuration...
[OK]
msk-donskaya-ioithenko-sw-2#
```

Рис. 10: Portfast

Рис. 11: Portfast

Рис. 12: Проверка отказоустойчивости

```
msk-donskaya-ioithenko-sw-3(config)#spanning-tree mode rapid-pvst
msk-donskaya-ioithenko-sw-3(config)#
```

Рис. 13: Rapid PVST+

Рис. 14: Проверка отказоустойчивости

```
msk-donskaya-ioithenko-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-ioithenko-sw-1(config)#int range f0/20 - 23
msk-donskaya-ioithenko-sw-1(config-if-range)#channel-group 1 mode on
msk-donskaya-ioithenko-sw-1(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINK-5-CHANGED: Interface Port-channel1, changed state to up

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

%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, Fa0/21is 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 )

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to down

msk-donskaya-ioithenko-sw-1(config-if-range)#exit
msk-donskaya-ioithenko-sw-1(config)#
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/20 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/20 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/21 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/20 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/22 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/20 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/20 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/21 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/21 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/21 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/22 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/21 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/20 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/22 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/21 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/22 (104).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/22 (1), with msk-
donskaya-ioithenko-sw-4 FastEthernet0/22 (104).
int port-channel 1
msk-donskaya-ioithenko-sw-1(config-if)#swithport mode trunk

msk-donskaya-ioithenko-sw-1(config-if)#
```

Рис. 15: Агрегированное соединение

```
msk-donskaya-ioithenko-sw-4(config)#int range f0/20 -23
msk-donskaya-ioithenko-sw-4(config-if-range)#no switchport
%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/20 (104), with
msk-donskaya-ioithenko-sw-1 FastEthernet0/20 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/21 (104), with
msk-donskaya-ioithenko-sw-1 FastEthernet0/21 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/22 (104), with
msk-donskaya-ioithenko-sw-1 FastEthernet0/22 (1).

%CDP-4-NATIVE_VLAN_MISMATCH: Native VLAN mismatch discovered on FastEthernet0/22 (104), with
msk-donskaya-ioithenko-sw-1 Port-
msk-donskaya-ioithenko-sw-4(config-if-range)#no switchport access vlan 104
msk-donskaya-ioithenko-sw-4(config-if-range)#exit
msk-donskaya-ioithenko-sw-4(config)#int range f0/20 -23
msk-donskaya-ioithenko-sw-4(config-if-range)#channel-group 1 mode on
msk-donskaya-ioithenko-sw-4(config-if-range)#
Creating a port-channel interface Port-channel 1

%LINK-5-CHANGED: Interface Port-channel1, changed state to up

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

%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, Fa0/21is 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 )

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/23, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan2, changed state to down
%SPANTREE-2-RECV_PVID_ERR: Received 802.1Q BPDU on non trunk Port-channel1 VLAN1.

%SPANTREE-2-BLOCK_PVID_LOCAL: Blocking Port-channel1 on VLAN0001. Inconsistent port type.


msk-donskaya-ioithenko-sw-4(config-if-range)#exit
msk-donskaya-ioithenko-sw-4(config)#int port-channel 1
msk-donskaya-ioithenko-sw-4(config-if)#switchport mode trunk

msk-donskaya-ioithenko-sw-4(config-if)##%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking Port-
channel1 on VLAN0001. Port consistency restored.

%SPANTREE-2-UNBLOCK_CONSIST_PORT: Unblocking Port-channel1 on VLAN0001. Port consistency
restored.
```

Рис. 16: Агрегированме каналов

В ходе лабораторной работы я изучила возможности протокола STP и его модификаций по обеспечению отказоустойчивости сети, агрегированию интерфейсов и перераспределению нагрузки между ними.