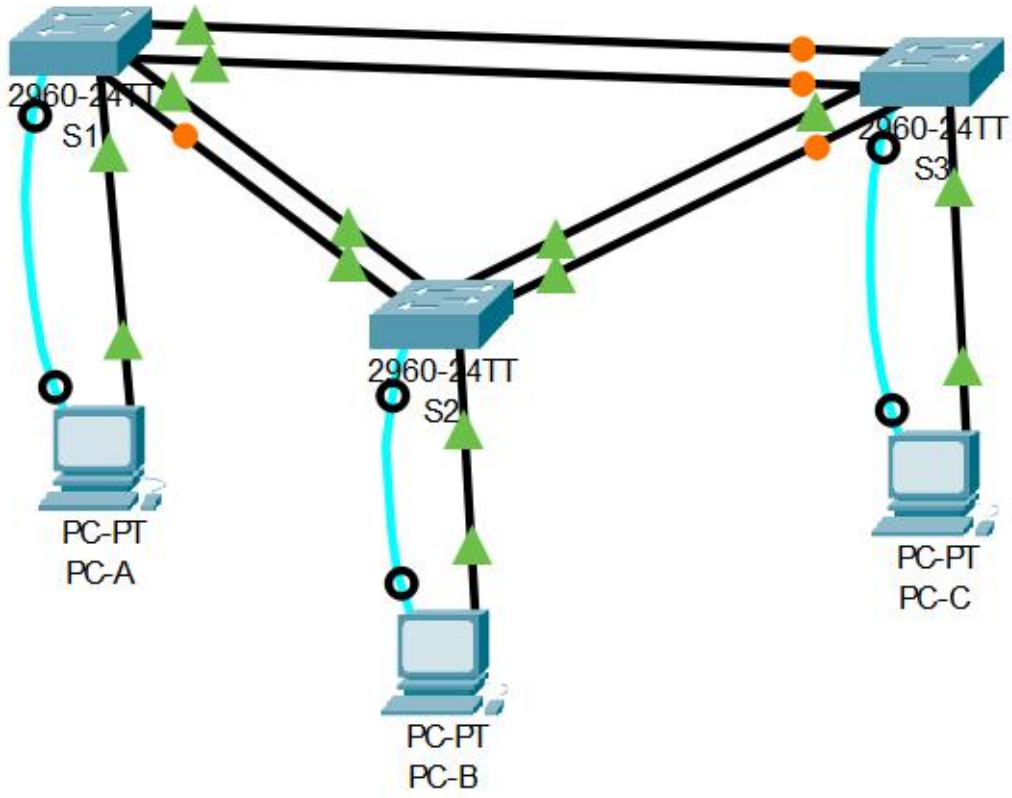
Практическая работа №5

Часть 1: Настройка основных параметров коммутатора

Была создана сеть согласно топологии



Настройка коммутаторов

```
Switch(config)#no ip domain-lookup
Switch(config)#hostname S1_Sidorov
S1_Sidorov(config)#service password-encryption
S1_Sidorov(config)#banner motd #Unauthorized access is prohibited.#
S1_Sidorov(config)#enable secret class
S1_Sidorov(config)#line console 0
S1_Sidorov(config-line)#password cisco
S1_Sidorov(config-line)#login
S1_Sidorov(config-line)#logging synchronous
S1_Sidorov(config-line)#exit
S1_Sidorov(config)#line vty 0 15
S1_Sidorov(config-line)#password cisco
S1_Sidorov(config-line)#login
S1_Sidorov(config-line)#exit
```

Настройка базовых параметров коммутатора 1

Аналогично для коммутаторов S2 и S3

```
S1_Sidorov(config-vlan)#exit
S1_Sidorov(config)#vlan 99
S1_Sidorov(config-vlan)#name Management
S1_Sidorov(config-vlan)#exit
S1_Sidorov(config)#vlan 31
S1_Sidorov(config-vlan)#name Staff
S1_Sidorov(config-vlan)#exit
S1_Sidorov(config)#interface f0/6
S1_Sidorov(config-if)#switchport mode access
S1_Sidorov(config-if)#switchport access vlan 31
S1_Sidorov(config-if)#exit
S1_Sidorov(config)#interface vlan 99
S1_Sidorov(config-if)#
%LINK-5-CHANGED: Interface Vlan99, changed state to up

S1_Sidorov(config-if)#ip address 192.168.99.11 255.255.255.0
S1_Sidorov(config-if)#exit
S1_Sidorov(config)#exit
S1_Sidorov#
%SYS-5-CONFIG_I: Configured from console by console

S1_Sidorov#write memory
Building configuration...
[OK]
```

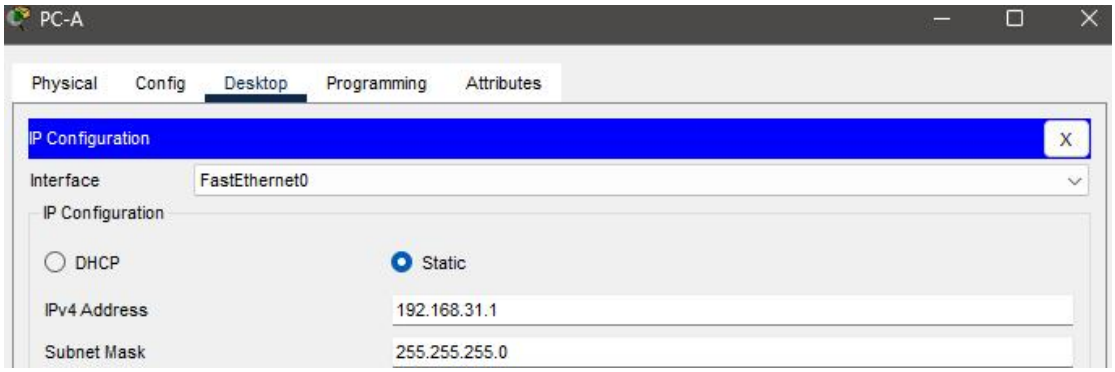
```
S1_Sidorov(config)#interface range f0/1-f0/4
S1_Sidorov(config-if-range)#switchport mode access
S1_Sidorov(config-if-range)#switchport access vlan 31
S1_Sidorov(config-if-range)#exit
S1_Sidorov(config)#exit
S1_Sidorov#
%SYS-5-CONFIG_I: Configured from console by console

S1_Sidorov#write memory
Building configuration...
[OK]
```

Настройка портов коммутатора 1

Аналогично для S2 и S3 с подстановкой ip адресов 192.168.99.12 и 192.168.99.13 соответственно.

Настройка компьютеров



Настройка компьютера PC-A

Аналогично для PC-B и PC-C с подстановкой ip адресов 192.168.31.2 и 192.168.31.3 соответственно

Часть 2 : Настройка протокола PAgP

Настройка протокола PAgP

```
S1_Sidorov(config)#interface range f0/3-4
S1_Sidorov(config-if-range)#channel-group 1 mode desirable
S1_Sidorov(config-if-range)#
Creating a port-channel interface Port-channel 1

S1_Sidorov(config-if-range)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/3, changed state to down

%LINK-5-CHANGED: Interface FastEthernet0/4, changed state to down
```

Настройка PAgP на коммутаторе S1_Sidorov, аналогично для S3 с mode auto

Проверка объеденненности портов

```
S1_Sidorov#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------

1      Po1(SU)           PAgP   Fa0/3(P) Fa0/4(P)
```

Коммутатор S1_Sidorov

```
S3(config)#do show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------

1      Po1(SU)           PAgP   Fa0/3(P) Fa0/4(P)
```

Коммутатор S3

Настройка транковых портов

```
S1_Sidorov(config)#interface po1
S1_Sidorov(config-if)#switchport mode trunk

S1_Sidorov(config-if)#switchport trunk native vlan 99
```

Коммутатор S1_Sidorov

```
S3(config)#interface po1
S3(config-if)#switchport mode trunk

S3(config-if)#switchport trunk native vlan 99
```

Коммутатор S3

Проверка

```
S3#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Po1         on           802.1q         trunking      99

Port        Vlans allowed on trunk
Po1         1-1005

Port        Vlans allowed and active in management domain
Po1         1,31,99

Port        Vlans in spanning tree forwarding state and not pruned
Po1         none

S3#show spanning-tree
VLAN0031
  Spanning tree enabled protocol ieee
  Root ID     Priority    32799
              Address     0060.2F59.268C
              Cost        12
              Port        28(Port-channel1)
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32799  (priority 32768 sys-id-ext 31)
              Address     00D0.FFE6.E732
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/18           Desg FWD 19        128.18   P2p
Po1              Root BKN*12        128.28   Shr *TYPE_Inc
```

Коммутатор S3

```
S1_Sidorov#show interfaces trunk
Port        Mode         Encapsulation  Status        Native vlan
Po1         on           802.1q         trunking      99

Port        Vlans allowed on trunk
Po1         1-1005

Port        Vlans allowed and active in management domain
Po1         1,31,99

Port        Vlans in spanning tree forwarding state and not pruned
Po1         31

S1_Sidorov#show spanning-tree
VLAN0031
  Spanning tree enabled protocol ieee
  Root ID     Priority    32799
              Address     0060.2F59.268C
              This bridge is the root
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec

  Bridge ID   Priority    32799  (priority 32768 sys-id-ext 31)
              Address     0060.2F59.268C
              Hello Time  2 sec  Max Age 20 sec  Forward Delay 15 sec
              Aging Time  20

Interface        Role Sts Cost      Prio.Nbr Type
---------------- ---- --- --------- -------- --------------------------------
Fa0/6            Desg FWD 19        128.6    P2p
Po1              Desg FWD 12        128.28   Shr
```

Коммутатор S1_Sidorov

Часть 3: Настройка протокола LACP

Настройка LACP между S1_Sidorov и S2

```
S1_Sidorov(config)#interface range f0/1 - 2
S1_Sidorov(config-if-range)#channel-group 2 mode active
S1_Sidorov(config-if-range)#
Creating a port-channel interface Port-channel 2

S1_Sidorov(config-if-range)#exit
S1_Sidorov(config)#interface port-channel 2
S1_Sidorov(config-if)#switchport mode trunk
S1_Sidorov(config-if)#switchport native vlan 99
                                ^
% Invalid input detected at '^' marker.

S1_Sidorov(config-if)#switchport trunk native vlan 99
S1_Sidorov(config-if)#exit
```

Настройка LACP на коммутаторе S1_Sidorov

```
S2(config)#interface range F0/1-2
S2(config-if-range)#channel-group 2 mode passive
S2(config-if-range)#
Creating a port-channel interface Port-channel 2

S2(config-if-range)#exit
S2(config)#interface port-channel 2
S2(config-if)#switchport mode trunk
S2(config-if)#switchport trunk native vlan 99
S2(config-if)#exit
```

Настройка LACP на коммутаторе S2

```
S1_Sidorov#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 2
Number of aggregators:           2

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------------------------

1      Po1(SU)           PAgP   Fa0/3(P) Fa0/4(P)
2      Po2(SU)           LACP   Fa0/1(P) Fa0/2(P)
```

Проверка на коммутаторе S1_Sidorov

```
S2#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 1
Number of aggregators:           1

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------

2      Po2(SU)           LACP   Fa0/1(P) Fa0/2(P)
```

Проверка на коммутаторе S2

Настройка LACP для S2 и S3

```
S3(config)#interface range f0/1-2
S3(config-if-range)#channel-group 3 mode active
S3(config-if-range)#
Creating a port-channel interface Port-channel 3

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/2, changed state to up

S3(config-if-range)#exit
S3(config)#interface port-channel 3
S3(config-if)#switchport mode trunk
S3(config-if)#switchport trunk native vlan 99
```

Настройка на коммутаторе S3

```
S2(config)#interface range f0/3-f0/4
S2(config-if-range)#channel-group 3 mode passive
S2(config-if-range)#
Creating a port-channel interface Port-channel 3

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/3, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to down

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/4, changed state to up
```

```
S2(config-if-range)#exit
S2(config)#interface port-channel 3
S2(config-if)#switchport mode trunk
```

```
S2(config-if)#switchport trunk native vlan 99
S2(config-if)#exit
```

Настройка коммутатора S2

```
S2#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 2
Number of aggregators:           2

Group  Port-channel  Protocol    Ports
------+-------------+-----------+-----------------------------

2      Po2(SU)           LACP   Fa0/1(P) Fa0/2(P)
3      Po3(SU)           LACP   Fa0/3(P) Fa0/4(P)
```

Проверка на коммутаторе S2

```
S3#show etherchannel summary
Flags:  D - down        P - in port-channel
        I - stand-alone s - suspended
        H - Hot-standby (LACP only)
        R - Layer3      S - Layer2
        U - in use      f - failed to allocate aggregator
        u - unsuitable for bundling
        w - waiting to be aggregated
        d - default port


Number of channel-groups in use: 2
Number of aggregators:           2

Group  Port-channel  Protocol    Ports
------+-------------+-----------
+---------------------------------------------

1      Po1(SU)           PAgP   Fa0/3(P) Fa0/4(P)
3      Po3(SU)           LACP   Fa0/1(P) Fa0/2(P)
```

Проверка на коммутаторе S3

Проверка наличия сквозного соединения

```
C:\>ping 192.168.31.2

Pinging 192.168.31.2 with 32 bytes of data:

Reply from 192.168.31.2: bytes=32 time=1ms TTL=128
Reply from 192.168.31.2: bytes=32 time<1ms TTL=128
Reply from 192.168.31.2: bytes=32 time<1ms TTL=128
Reply from 192.168.31.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.31.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.31.3

Pinging 192.168.31.3 with 32 bytes of data:

Reply from 192.168.31.3: bytes=32 time<1ms TTL=128
Reply from 192.168.31.3: bytes=32 time<1ms TTL=128
Reply from 192.168.31.3: bytes=32 time<1ms TTL=128
Reply from 192.168.31.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.31.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Ping с PC-A на PC-B и PC-C

```
S1_Sidorov#ping
Protocol [ip]:
Target IP address: 192.168.99.12
Repeat count [5]:
Datagram size [100]:
Timeout in seconds [2]:
Extended commands [n]:
Sweep range of sizes [n]:
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.99.12, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 0/0/0 ms

S1_Sidorov#ping 192.168.99.13

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.99.13, timeout is 2 seconds:
..!!!
Success rate is 60 percent (3/5), round-trip min/avg/max = 0/3/10 ms
```

Ping с S1_Sidorov на S2 и S3