



МІНІСТЕРСТВО ОСВІТИ І НАУКИ, МОЛОДІ ТА СПОРТУ УКРАЇНИ
НАЦІОНАЛЬНИЙ ТЕХНІЧНИЙ УНІВЕРСИТЕТ УКРАЇНИ
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ ІМЕНІ ІГОРЯ СІКОРСЬКОГО»
ФІЗИКО-ТЕХНІЧНИЙ ІНСТИТУТ
Кафедра Інформаційної Безпеки

Практикум з Основ комп'ютерних мереж
Налаштування локальної мережі

Перевірив:

Виконав:

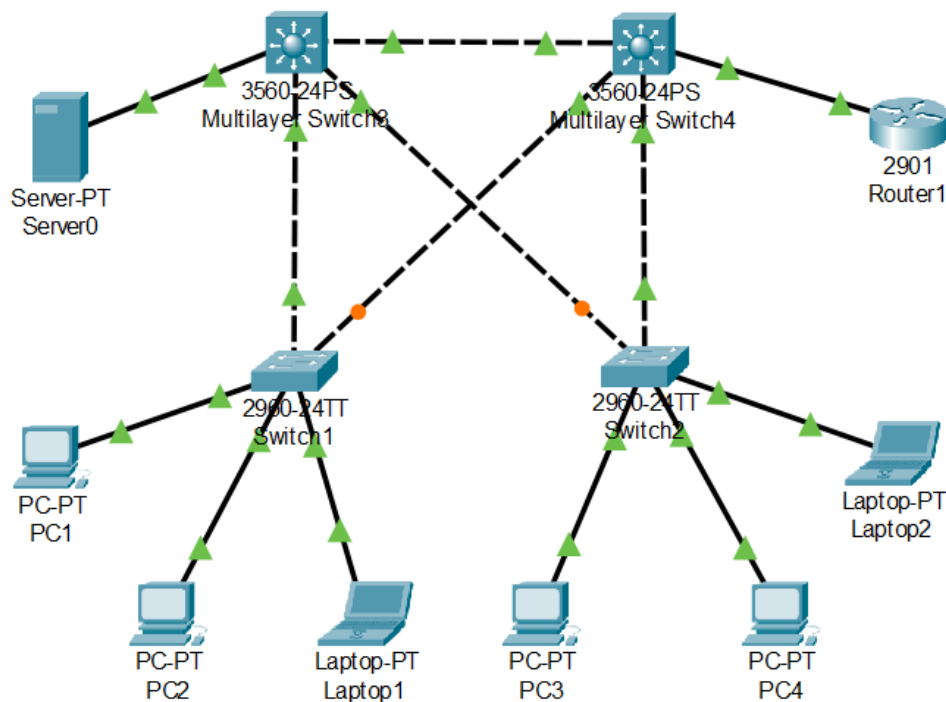
студент I курсу

групи ФБ-01

Сахній Н.Р.

Київ 2021

1.18	192.168.18.0/25	192.168.18.176/28
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Варіант 18

subnet 1: 192.168.18.0/25
gateway: 192.168.18.1
broadcast: 192.168.127

subnet 2: 192.168.18.176/28
gateway: 192.168.18.177
broadcast: 192.168.18.191

PC1 - 192.168.18.5
PC2 - 192.168.18.6
PC3 - 192.168.18.7
PC4 - 192.168.18.8
Laptop1 - 192.168.18.180 (DHCP)
Laptop2 - 192.168.18.181 (DHCP)
Server0 - 192.168.18.190

Перевірка та діагностика

Перевірте досяжність між хостами в різних VLAN.

PC1 and PC2

PC1 → Laptop1:

```
C:\>ping 192.168.18.180

Pinging 192.168.18.180 with 32 bytes of data:

Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.18.180:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC1 → Laptop2:

```
C:\>ping 192.168.18.181

Pinging 192.168.18.181 with 32 bytes of data:

Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.18.181:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC2 → Laptop1:

```
C:\>ping 192.168.18.180

Pinging 192.168.18.180 with 32 bytes of data:

Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time=11ms TTL=127
Reply from 192.168.18.180: bytes=32 time=1ms TTL=127
Reply from 192.168.18.180: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.18.180:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 3ms
```

PC2 → Laptop2:

```
C:\>ping 192.168.18.181

Pinging 192.168.18.181 with 32 bytes of data:

Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time=11ms TTL=127
Reply from 192.168.18.181: bytes=32 time=1ms TTL=127
Reply from 192.168.18.181: bytes=32 time=10ms TTL=127

Ping statistics for 192.168.18.181:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms
```

PC3 and PC4

PC3 → Laptop1:

```
Packet Tracer PC Command Line 1.0
C:\>ping 192.168.18.180

Pinging 192.168.18.180 with 32 bytes of data:

Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time=10ms TTL=127

Ping statistics for 192.168.18.180:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms
```

PC3 → Laptop2:

```
C:\>ping 192.168.18.181

Pinging 192.168.18.181 with 32 bytes of data:

Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127

Ping statistics for 192.168.18.181:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC4 → Laptop1:

```
C:\>ping 192.168.18.180

Pinging 192.168.18.180 with 32 bytes of data:

Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time<1ms TTL=127
Reply from 192.168.18.180: bytes=32 time=1ms TTL=127
Reply from 192.168.18.180: bytes=32 time=11ms TTL=127

Ping statistics for 192.168.18.180:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 3ms
```

PC4 → Laptop2:

```
C:\>ping 192.168.18.181

Pinging 192.168.18.181 with 32 bytes of data:

Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time<1ms TTL=127
Reply from 192.168.18.181: bytes=32 time=1ms TTL=127

Ping statistics for 192.168.18.181:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Перевірте стан інтерфейсів, VLAN і маршрутизації.

show vlan brief

```
SW1#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	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
10 VLAN0010	active	Fa0/1, Fa0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

```
SW2#show vlan brief
```

VLAN Name	Status	Ports
1 default	active	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
10 VLAN0010	active	Fa0/1, Fa0/2
1002 fddi-default	active	
1003 token-ring-default	active	
1004 fddinet-default	active	
1005 trnet-default	active	

show interface trunk

```
SW1#show interface trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Gig0/1	on	802.1q	trunking	1
Gig0/2	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Gig0/1	1-1005
Gig0/2	1-1005

Port	Vlans allowed and active in management domain
Gig0/1	1,10
Gig0/2	1,10

Port	Vlans in spanning tree forwarding state and not pruned
Gig0/1	1,10
Gig0/2	none

```
SW2#show interface trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Gig0/1	on	802.1q	trunking	1
Gig0/2	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Gig0/1	1-1005
Gig0/2	1-1005

Port	Vlans allowed and active in management domain
Gig0/1	1,10
Gig0/2	1,10

Port	Vlans in spanning tree forwarding state and not pruned
Gig0/1	1,10
Gig0/2	none

```
SW3#show interface trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1
Gig0/1	on	802.1q	trunking	1
Gig0/2	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Fa0/1	1-1005
Gig0/1	1-1005
Gig0/2	1-1005

Port	Vlans allowed and active in management domain
Fa0/1	1,10
Gig0/1	1,10
Gig0/2	1,10

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,10
Gig0/1	1,10
Gig0/2	1,10

```
SW4#show interface trunk
```

Port	Mode	Encapsulation	Status	Native vlan
Fa0/1	on	802.1q	trunking	1
Fa0/2	on	802.1q	trunking	1
Gig0/1	on	802.1q	trunking	1
Gig0/2	on	802.1q	trunking	1

Port	Vlans allowed on trunk
Fa0/1	1-1005
Fa0/2	1-1005
Gig0/1	1-1005
Gig0/2	1-1005

Port	Vlans allowed and active in management domain
Fa0/1	1,10
Fa0/2	1,10
Gig0/1	1,10
Gig0/2	1,10

Port	Vlans in spanning tree forwarding state and not pruned
Fa0/1	1,10
Fa0/2	1,10
Gig0/1	1,10
Gig0/2	1,10

R1#show interface gi0/0

GigabitEthernet0/0 is up, line protocol is up (connected)

Hardware is CN Gigabit Ethernet, address is 0005.5e45.7801 (bia 0005.5e45.7801)

.....

R1#show ip interface gi0/0.01

GigabitEthernet0/0.1 is up, line protocol is up (connected)

Internet address is 192.168.18.1/25

Broadcast address is 255.255.255.255

.....

R1#show ip interface gi0/0.02

GigabitEthernet0/0.2 is up, line protocol is up (connected)

Internet address is 192.168.18.177/28

Broadcast address is 255.255.255.255

.....

R1#show ip route

192.168.18.0/24 is variably subnetted, 4 subnets, 3 masks

C 192.168.18.0/25 is directly connected, GigabitEthernet0/0.1

L 192.168.18.1/32 is directly connected, GigabitEthernet0/0.1

C 192.168.18.176/28 is directly connected, GigabitEthernet0/0.2

L 192.168.18.177/32 is directly connected, GigabitEthernet0/0.2

Після виконання завдань роботи, налаштування маршрутизаторів і комутаторів виглядають наступним чином:

SW1#show running-config

```
!  
hostname SW1  
!  
interface FastEthernet0/1  
    switchport access vlan 10  
!  
interface FastEthernet0/2  
    switchport access vlan 10  
!  
interface GigabitEthernet0/1  
    switchport mode trunk  
!  
interface GigabitEthernet0/2  
    switchport mode trunk
```

SW2#sh run

```
!  
hostname SW2  
!  
interface FastEthernet0/1  
    switchport access vlan 10  
!  
interface FastEthernet0/2  
    switchport access vlan 10  
!  
interface GigabitEthernet0/1  
    switchport mode trunk  
!  
interface GigabitEthernet0/2  
    switchport mode trunk
```

SW3#sh run

```
!  
hostname SW3  
!  
interface FastEthernet0/1  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface GigabitEthernet0/1  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface GigabitEthernet0/2  
    switchport trunk encapsulation dot1q  
    switchport mode trunk
```

SW4#sh run

```
!  
hostname SW4  
!  
interface FastEthernet0/1  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface FastEthernet0/2  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface GigabitEthernet0/1  
    switchport trunk encapsulation dot1q  
    switchport mode trunk  
!  
interface GigabitEthernet0/2  
    switchport trunk encapsulation dot1q  
    switchport mode trunk
```

R1#sh run

```
!  
hostname R1  
!  
interface GigabitEthernet0/0.1  
    encapsulation dot1Q 10  
    ip address 192.168.18.1 255.255.255.128  
!  
interface GigabitEthernet0/0.2  
    encapsulation dot1Q 1 native  
    ip address 192.168.18.177 255.255.255.240
```