Практическаяработа №1

УП 02.01 Программное обеспечение сетей

На тему: «Настройка статической маршрутизации»

по специальности 09.02.02 «Компьютерные сети»

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2020 г

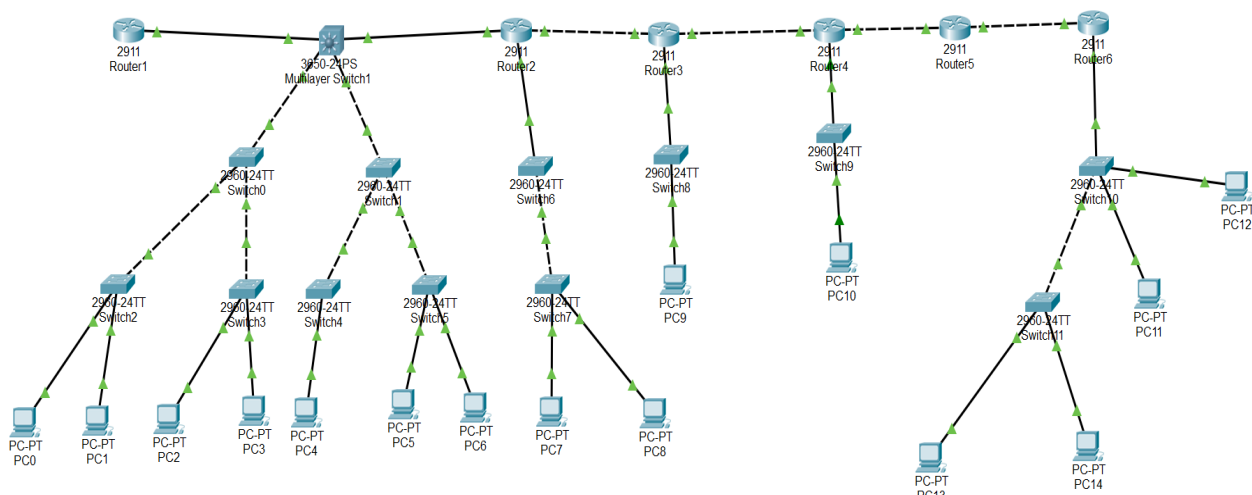Ход работы.

1) Топология (Рис.1)

Рис.1 — Топология.

2) По заданию нужно было настроить статическую маршрутизацию dhcp, vlan, а также ssh. Все было настроено, только ssh настроен только на последнем и первым маршрутизатором, настройка однообразная поэтому не вижу смысла везде это проделывать. Проверяем маршрутизацию (Рис.2).

Рис.2 — Tracert с пк 12 до пк0 и аналогично в другую сторону.

Проверка ssh (Рис.3).
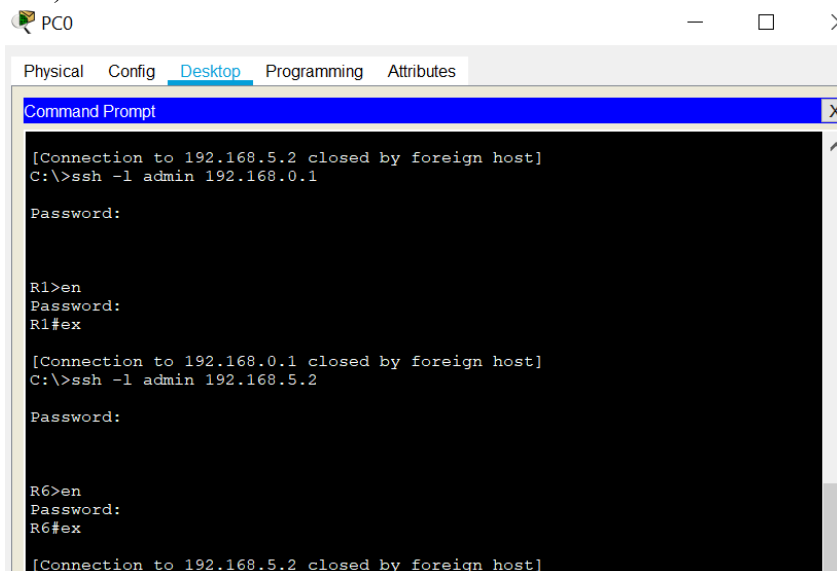
Рис.3 — Проверка ssh.

Конфигурация устройств.

Конфигурация R1.

Building configuration...

```
Current configuration : 949 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname R1
!
!
!
enable password 7 0822455D0A16
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
username admin privilege 15 secret 5 $1$mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
license udi pid CISCO2911/K9 sn FTX152417N1-
!
!
!
!
!
!
!
!
!
ip ssh version 2
ip domain-name dom.dom
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
ip address 192.168.0.1 255.255.255.252
duplex auto
speed auto
!
interface GigabitEthernet0/1
```

```
no ip address
duplex auto
speed auto
shutdown
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
ip classless
ip route 192.168.2.0 255.255.255.0 192.168.0.2
ip route 0.0.0.0 0.0.0.0 192.168.0.2
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
line vty 5 15
login
!
!
!
end
```

Конфигурация L3 коммутатора.

```
Building configuration...


Current configuration : 2631 bytes
!
version 16.3.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
```

```
!
!
ip dhcp excluded-address 192.168.2.1
ip dhcp excluded-address 192.168.20.1
ip dhcp excluded-address 192.168.35.1
ip dhcp excluded-address 192.168.50.1
!
ip dhcp pool 2
network 192.168.2.0 255.255.255.0
default-router 192.168.2.1
ip dhcp pool 20
network 192.168.20.0 255.255.255.0
default-router 192.168.20.1
ip dhcp pool 35
network 192.168.35.0 255.255.255.0
default-router 192.168.35.1
ip dhcp pool 50
network 192.168.50.0 255.255.255.0
default-router 192.168.50.1
!
!
!
ip cef
ip routing
!
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet1/0/1
switchport trunk allowed vlan 2,20,35,50
switchport trunk encapsulation dot1q
switchport mode trunk
spanning-tree portfast trunk
!
interface GigabitEthernet1/0/2
switchport trunk allowed vlan 2,20,35,50
switchport trunk encapsulation dot1q
```

```
switchport mode trunk
spanning-tree portfast trunk
!
interface GigabitEthernet1/0/3
no switchport
ip address 192.168.0.2 255.255.255.252
duplex auto
speed auto
!
interface GigabitEthernet1/0/4
no switchport
ip address 192.168.1.1 255.255.255.252
duplex auto
speed auto
!
interface GigabitEthernet1/0/5
!
interface GigabitEthernet1/0/6
!
interface GigabitEthernet1/0/7
!
interface GigabitEthernet1/0/8
!
interface GigabitEthernet1/0/9
!
interface GigabitEthernet1/0/10
!
interface GigabitEthernet1/0/11
!
interface GigabitEthernet1/0/12
!
interface GigabitEthernet1/0/13
!
interface GigabitEthernet1/0/14
!
interface GigabitEthernet1/0/15
!
interface GigabitEthernet1/0/16
!
interface GigabitEthernet1/0/17
!
interface GigabitEthernet1/0/18
!
interface GigabitEthernet1/0/19
!
interface GigabitEthernet1/0/20
!
interface GigabitEthernet1/0/21
!
interface GigabitEthernet1/0/22
!
interface GigabitEthernet1/0/23
!
interface GigabitEthernet1/0/24
!
```

```
interface GigabitEthernet1/1/1
!
interface GigabitEthernet1/1/2
!
interface GigabitEthernet1/1/3
!
interface GigabitEthernet1/1/4
!
interface Vlan1
no ip address
shutdown
!
interface Vlan2
mac-address 0001.9621.1401
ip address 192.168.2.1 255.255.255.0
!
interface Vlan20
mac-address 0001.9621.1402
ip address 192.168.20.1 255.255.255.0
!
interface Vlan35
mac-address 0001.9621.1403
ip address 192.168.35.1 255.255.255.0
!
interface Vlan50
mac-address 0001.9621.1404
ip address 192.168.50.1 255.255.255.0
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.1.2
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
!
end
```

Конфигурация R2.

Building configuration...

Current configuration : 1442 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
ip dhcp excluded-address 192.168.200.1
ip dhcp excluded-address 192.168.201.1
!
ip dhcp pool 200
network 192.168.200.0 255.255.255.0
default-router 192.168.200.1
ip dhcp pool 300
network 192.168.201.0 255.255.255.0
default-router 192.168.201.1
!
!
!
ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX15249BN9-
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
interface GigabitEthernet0/0
ip address 192.168.1.2 255.255.255.252
duplex auto
speed auto

```
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/1.200
encapsulation dot1Q 200
ip address 192.168.200.1 255.255.255.0
!
interface GigabitEthernet0/1.300
encapsulation dot1Q 300
ip address 192.168.201.1 255.255.255.0
!
interface GigabitEthernet0/2
ip address 192.168.22.1 255.255.255.252
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.22.2
ip route 192.168.2.0 255.255.255.0 192.168.1.1
ip route 192.168.20.0 255.255.255.0 192.168.1.1
ip route 192.168.50.0 255.255.255.0 192.168.1.1
ip route 192.168.35.0 255.255.255.0 192.168.1.1
ip route 192.168.0.0 255.255.255.252 192.168.1.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

Конфигурация R3.

Building configuration...

```
Current configuration : 1144 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
ip dhcp excluded-address 192.168.60.1
!
ip dhcp pool 60
network 192.168.60.0 255.255.255.0
default-router 192.168.60.1
!
!
!
ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524X87D-
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
ip address 192.168.22.2 255.255.255.252
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 192.168.60.1 255.255.255.0
duplex auto
speed auto
!
```

```
interface GigabitEthernet0/2
ip address 192.168.3.1 255.255.255.252
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.22.1
ip route 192.168.100.0 255.255.255.0 192.168.3.2
ip route 192.168.131.0 255.255.255.0 192.168.5.2
ip route 192.168.120.0 255.255.255.0 192.168.5.2
ip route 192.168.4.0 255.255.255.252 192.168.3.2
ip route 192.168.5.0 255.255.255.252 192.168.3.2
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

Конфигурация R4.

Building configuration...

```
Current configuration : 1008 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
ip dhcp pool 100
```

```
network 192.168.100.0 255.255.255.0
default-router 192.168.100.1
!
!
!
ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX15245MN1-
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
ip address 192.168.3.2 255.255.255.252
duplex auto
speed auto
!
interface GigabitEthernet0/1
ip address 192.168.100.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/2
ip address 192.168.4.1 255.255.255.252
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.3.1
ip route 192.168.5.0 255.255.255.252 192.168.4.2
ip route 192.168.131.0 255.255.255.0 192.168.5.2
ip route 192.168.120.0 255.255.255.0 192.168.5.2
!
```

```
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

Конфигурация R5.

Building configuration...

```
Current configuration : 859 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
license udi pid CISCO2911/K9 sn FTX1524010S-
!
!
!
!
!
!
!
!
```

```
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface GigabitEthernet0/0
 ip address 192.168.4.2 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/1
 ip address 192.168.5.1 255.255.255.252
 duplex auto
 speed auto
!
interface GigabitEthernet0/2
 no ip address
 duplex auto
 speed auto
 shutdown
!
interface Vlan1
 no ip address
 shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.4.1
ip route 192.168.131.0 255.255.255.0 192.168.5.2
ip route 192.168.120.0 255.255.255.0 192.168.5.2
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
 login
!
!
!
end
```

Конфигурация R6.

Building configuration...

Current configuration : 1337 bytes
!
version 15.1
no service timestamps log datetime msec
no service timestamps debug datetime msec
service password-encryption
!
hostname R6
!
!
!
enable password 7 0822455D0A16
!
!
ip dhcp excluded-address 192.168.131.1
ip dhcp excluded-address 192.168.120.1
!
ip dhcp pool 120
network 192.168.120.0 255.255.255.0
default-router 192.168.120.1
ip dhcp pool 131
network 192.168.131.0 255.255.255.0
default-router 192.168.131.1
!
!
!
ip cef
no ipv6 cef
!
!
!
username admin privilege 15 secret 5 1mERr$hx5rVt7rPNoS4wqbXKX7m0
!
!
license udi pid CISCO2911/K9 sn FTX15247R6O-
!
!
!
!
!
!
!
!
!
ip ssh version 2
ip domain-name dom.dom
!
!
spanning-tree mode pvst
!

```
!
!
!
!
!
interface GigabitEthernet0/0
ip address 192.168.5.2 255.255.255.252
duplex auto
speed auto
!
interface GigabitEthernet0/1
no ip address
duplex auto
speed auto
!
interface GigabitEthernet0/1.120
encapsulation dot1Q 120
ip address 192.168.120.1 255.255.255.0
!
interface GigabitEthernet0/1.131
encapsulation dot1Q 131
ip address 192.168.131.1 255.255.255.0
!
interface GigabitEthernet0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
ip classless
ip route 0.0.0.0 0.0.0.0 192.168.5.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
line vty 5 15
login
!
!
```

!

end

Конфигурация коммутаторов

S0.

Building configuration...

Current configuration : 1550 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Switch

!

!

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

 switchport trunk allowed vlan 2,20,35,50

 switchport mode trunk

 spanning-tree portfast trunk

!

interface FastEthernet0/2

 switchport trunk allowed vlan 2,20,35,50

 switchport mode trunk

!

interface FastEthernet0/3

 switchport trunk allowed vlan 2,20,35,50

 switchport mode trunk

!

interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!

```
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 mac-address 0090.0c17.b301
 no ip address
!
interface Vlan20
 mac-address 0090.0c17.b302
 no ip address
!
interface Vlan35
 mac-address 0090.0c17.b303
 no ip address
!
interface Vlan50
 mac-address 0090.0c17.b304
 no ip address
!
!
!
!
line con 0
!
line vty 0 4
```

login

line vty 5 15

 login

!

!

!

!

end

S1.

Building configuration...

Current configuration : 1550 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Switch

!

!

!

!

!

spanning-tree mode pvst

spanning-tree extend system-id

!

interface FastEthernet0/1

 switchport trunk allowed vlan 2,20,35,50

 switchport mode trunk

 spanning-tree portfast trunk

!

interface FastEthernet0/2

 switchport trunk allowed vlan 2,20,35,50

 switchport mode trunk

!

```
interface FastEthernet0/3
 switchport trunk allowed vlan 2,20,35,50
 switchport mode trunk
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
!
interface FastEthernet0/19
!
```

```
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 mac-address 0006.2a42.8601
 no ip address
!
interface Vlan20
 mac-address 0006.2a42.8602
 no ip address
!
interface Vlan35
 mac-address 0006.2a42.8603
 no ip address
!
interface Vlan50
 mac-address 0006.2a42.8604
 no ip address
!
!
!
```

!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end

S2.

Building configuration...

Current configuration : 1491 bytes
!
version 12.2
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Switch
!
!
!
!
!
spanning-tree mode pvst
spanning-tree extend system-id
!
interface FastEthernet0/1
 switchport trunk allowed vlan 2,20,35,50
 switchport mode trunk
!
interface FastEthernet0/2

```
 switchport access vlan 2
 switchport mode access
!
interface FastEthernet0/3
 switchport access vlan 50
 switchport mode access
!
interface FastEthernet0/4
!
interface FastEthernet0/5
!
interface FastEthernet0/6
!
interface FastEthernet0/7
!
interface FastEthernet0/8
!
interface FastEthernet0/9
!
interface FastEthernet0/10
!
interface FastEthernet0/11
!
interface FastEthernet0/12
!
interface FastEthernet0/13
!
interface FastEthernet0/14
!
interface FastEthernet0/15
!
interface FastEthernet0/16
!
interface FastEthernet0/17
!
interface FastEthernet0/18
```

```
!
interface FastEthernet0/19
!
interface FastEthernet0/20
!
interface FastEthernet0/21
!
interface FastEthernet0/22
!
interface FastEthernet0/23
!
interface FastEthernet0/24
!
interface GigabitEthernet0/1
!
interface GigabitEthernet0/2
!
interface Vlan1
 no ip address
 shutdown
!
interface Vlan2
 mac-address 0000.0c98.8501
 no ip address
!
interface Vlan20
 mac-address 0000.0c98.8502
 no ip address
!
interface Vlan35
 mac-address 0000.0c98.8503
 no ip address
!
interface Vlan50
 mac-address 0000.0c98.8504
 no ip address
```

```
!
!
!
!
line con 0
!
line vty 0 4
 login
line vty 5 15
 login
!
!
!
!
end
```

Думаю хватит, а то там свитчей слишком много. Суть настройки ясна прокидываем vlan. И не забываем везде их поднять и сделать порты транковыми.