Лаборатория работа 15

Динамическая маршрутизация

ПОДГОТОВИЛА: КИМ РЕАЧНА
ГРУППА: НПИБД-02-20

Цель работы:

Настроить динамическую маршрутизацию между территориями организации.

Задание:

- Настроить динамическую маршрутизацию по протоколу OSPF на маршрутизаторах msk-donskaya-gw-1, msk-q42-gw-1, msk-hostel-gw-1, sch-sochi-gw-1.
- Настроить связь сети квартала 42 в Москве с сетью филиала в г. Сочи напрямую
- В режиме симуляции отследить движение пакета ICMP с ноутбука администратора сети на Донской в Москве (Laptop-PT admin) до компьютера пользователя в филиале в г. Сочи pc-sochi-1.
- На коммутаторе провайдера отключить временно vlan 6 и в режиме симуляции убедиться в изменении маршрута прохождения пакета ICMP с ноутбука администратора сети на Донской в Москве (Laptop-PT admin) до компьютера пользователя в филиале в г. Сочи pc-sochi-1.
- На коммутаторе провайдера восстановить vlan 6 и в режиме симуляции убедиться в изменении маршрута прохождения пакета ICMP с ноутбука администратора сети на Донской в Москве (Laptop-PT admin) до компьютера пользователя в филиале в г. Сочи pc-sochi-1.

Настройка OSPF

```
msk-donskaya-kim-gw-1>en
Password:
msk-donskaya-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-donskaya-kim-gw-1(config)#router ospf 1
msk-donskaya-kim-gw-1(config-router)#router-id 10.128.254.1
msk-donskaya-kim-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
msk-donskaya-kim-gw-1(config-router)#exit
msk-donskaya-kim-gw-1(config)#exit
msk-donskaya-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-donskaya-kim-gw-1#wr m
Building configuration...
[OK]
msk-donskaya-kim-gw-1#
```

```
msk-hostel-kim-gw-1>en
Password:
msk-hostel-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-hostel-kim-gw-1(config)#router ospf 1
msk-hostel-kim-gw-1(config-router)#router-id 10.128.254.3
msk-hostel-kim-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
msk-hostel-kim-gw-1(config-router)#exit
msk-hostel-kim-gw-1(config)#exit
msk-hostel-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-hostel-kim-gw-1#wr m
Building configuration...
[OK]
msk-hostel-kim-gw-1#
00:09:11: %OSPF-5-ADJCHG: Process 1, Nbr 10.128.254.2 on Vlan202 from LOADING to FULL,
Loading Done

msk-hostel-kim-gw-1#
```

```
msk-q42-kim-gw-1>en
Password:
msk-q42-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-gw-1(config)#router ospf 1
msk-q42-kim-gw-1(config-router)#router-id 10.128.254.2
msk-q42-kim-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
msk-q42-kim-gw-1(config-router)#exit
msk-q42-kim-gw-1(config)#exit
msk-q42-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-q42-kim-gw-1#wr m
Building configuration...
[OK]
msk-q42-kim-gw-1#
```

```
sch-sochi-kim-gw-1>en
Password:
sch-sochi-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-gw-1(config)#router ospf 1
sch-sochi-kim-gw-1(config-router)#router-id 10.128.254.4
sch-sochi-kim-gw-1(config-router)#network 10.0.0.0 0.255.255.255 area 0
sch-sochi-kim-gw-1(config-router)#exit
sch-sochi-kim-gw-1(config)#exit
sch-sochi-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-gw-1#wr m
Building configuration...
[OK]
sch-sochi-kim-gw-1#
00:11:48: %OSPF-5-ADJCHG: Process 1, Nbr 10.128.254.1 on FastEthernet0/0.6 from LOADING
to FULL, Loading Done
```

```
msk-donskaya-kim-gw-1#sh ip ospf
 Routing Process "ospf 1" with ID 10.128.254.1
 Supports only single TOS(TOS0) routes
 Supports opaque LSA
 SPF schedule delay 5 secs, Hold time between two SPFs 10 secs
 Minimum LSA interval 5 secs. Minimum LSA arrival 1 secs
 Number of external LSA 0. Checksum Sum 0x000000
 Number of opaque AS LSA 0. Checksum Sum 0x000000
 Number of DCbitless external and opaque AS LSA 0
 Number of DoNotAge external and opaque AS LSA 0
 Number of areas in this router is 1. 1 normal 0 stub 0 nssa
 External flood list length 0
    Area BACKBONE(0)
        Number of interfaces in this area is 8
        Area has no authentication
        SPF algorithm executed 1 times
        Area ranges are
        Number of LSA 1. Checksum Sum 0x00312a
        Number of opaque link LSA 0. Checksum Sum 0x000000
        Number of DCbitless LSA 0
        Number of indication LSA 0
        Number of DoNotAge LSA 0
        Flood list length 0
```

```
msk-donskaya-kim-gw-1#sh ip ospf neighbor

msk-donskaya-kim-gw-1#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is 198.51.100.1 to network 0.0.0.0

     10.0.0.0/8 is variably subnetted, 18 subnets, 4 masks
C       10.128.0.0/24 is directly connected, FastEthernet0/0.3
L       10.128.0.1/32 is directly connected, FastEthernet0/0.3
C       10.128.1.0/24 is directly connected, FastEthernet0/0.2
L       10.128.1.1/32 is directly connected, FastEthernet0/0.2
C       10.128.3.0/24 is directly connected, FastEthernet0/0.101
L       10.128.3.1/32 is directly connected, FastEthernet0/0.101
C       10.128.4.0/24 is directly connected, FastEthernet0/0.102
L       10.128.4.1/32 is directly connected, FastEthernet0/0.102
C       10.128.5.0/24 is directly connected, FastEthernet0/0.103
L       10.128.5.1/32 is directly connected, FastEthernet0/0.103
C       10.128.6.0/24 is directly connected, FastEthernet0/0.104
L       10.128.6.1/32 is directly connected, FastEthernet0/0.104
C       10.128.255.0/30 is directly connected, FastEthernet0/1.5
L       10.128.255.1/32 is directly connected, FastEthernet0/1.5
C       10.128.255.4/30 is directly connected, FastEthernet0/1.6
L       10.128.255.5/32 is directly connected, FastEthernet0/1.6
S       10.129.0.0/16 [1/0] via 10.128.255.2
S       10.130.0.0/16 [1/0] via 10.128.255.6
     198.51.100.0/24 is variably subnetted, 2 subnets, 2 masks
C       198.51.100.0/28 is directly connected, FastEthernet0/1.4
L       198.51.100.2/32 is directly connected, FastEthernet0/1.4
S*   0.0.0.0/0 [1/0] via 198.51.100.1

msk-donskaya-kim-gw-1#
```

Настройка линка 42-й квартал–Сочи

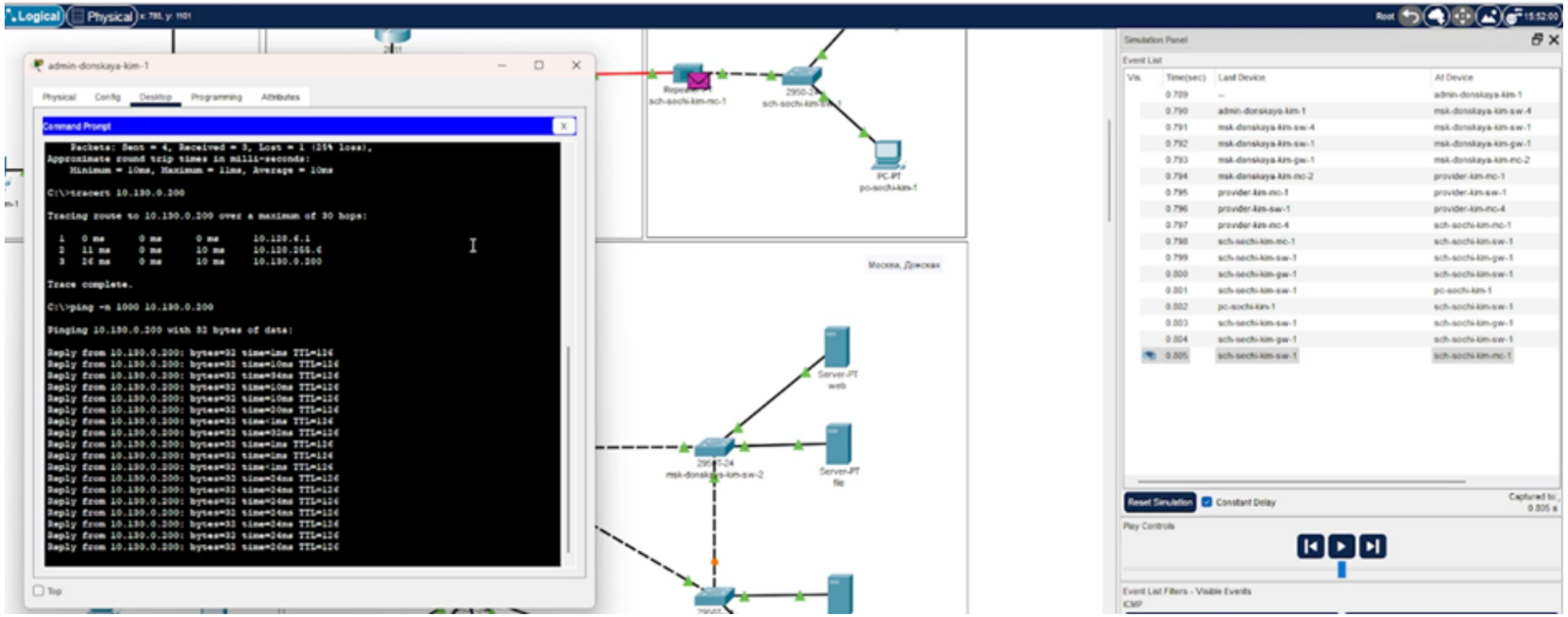
```
provider-kim-sw-1>en
Password:
provider-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
provider-kim-sw-1(config)#vlan 7
provider-kim-sw-1(config-vlan)#name q42-sochi
provider-kim-sw-1(config-vlan)#exit
provider-kim-sw-1(config)#int vlan7
provider-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan7, changed state to up

provider-kim-sw-1(config-if)#no shutdown
provider-kim-sw-1(config-if)#exit
provider-kim-sw-1(config)#exit
provider-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

provider-kim-sw-1#wr m
```

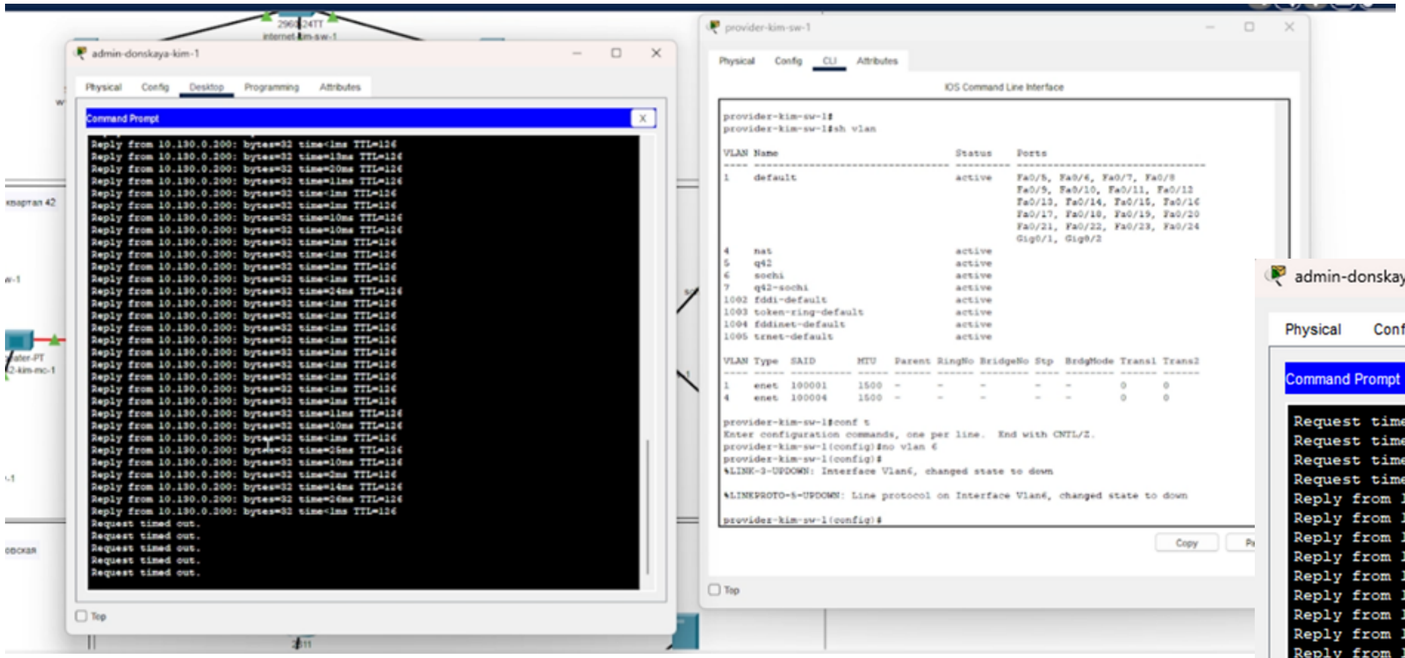
```
msk-q42-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
msk-q42-kim-gw-1(config)#int f0/1.7
msk-q42-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/1.7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/1.7, changed state to up

msk-q42-kim-gw-1(config-subif)#encapsulation dot1Q 7
msk-q42-kim-gw-1(config-subif)#ip address 10.128.255.9 255.255.255.252
msk-q42-kim-gw-1(config-subif)#description sochi
msk-q42-kim-gw-1(config-subif)#exit
msk-q42-kim-gw-1(config)#exit
msk-q42-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

msk-q42-kim-gw-1#wr m
Building configuration...
```

```
sch-sochi-kim-sw-1>en
Password:
sch-sochi-kim-sw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-sw-1(config)#vlan 7
sch-sochi-kim-sw-1(config-vlan)#name q42-sochi
sch-sochi-kim-sw-1(config-vlan)#exit
sch-sochi-kim-sw-1(config)#int vlan7
sch-sochi-kim-sw-1(config-if)#
%LINK-5-CHANGED: Interface Vlan7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan7, changed state to up

sch-sochi-kim-sw-1(config-if)#no shutdown
sch-sochi-kim-sw-1(config-if)#exit
sch-sochi-kim-sw-1(config)#exit
sch-sochi-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-sw-1#wr m
```

```
sch-sochi-kim-gw-1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
sch-sochi-kim-gw-1(config)#int f0/0.7
sch-sochi-kim-gw-1(config-subif)#
%LINK-5-CHANGED: Interface FastEthernet0/0.7, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0.7, changed state to up

sch-sochi-kim-gw-1(config-subif)#encapsulation dot1Q 7
sch-sochi-kim-gw-1(config-subif)#ip address 10.128.255.10 255.255.255.252
sch-sochi-kim-gw-1(config-subif)#description q42
sch-sochi-kim-gw-1(config-subif)#exit
sch-sochi-kim-gw-1(config)#exit
sch-sochi-kim-gw-1#
%SYS-5-CONFIG_I: Configured from console by console

sch-sochi-kim-gw-1#wr m
Building configuration...
[OK]
sch-sochi-kim-gw-1#
```

Отследить движение пакета ICMP





admin-donskaya-kim-1

Physical Config Desktop Programming Attributes

Command Prompt

```
Request timed out.
Request timed out.
Request timed out.
Request timed out.
Reply from 10.130.0.200: bytes=32 time=11ms TTL=125
Reply from 10.130.0.200: bytes=32 time=10ms TTL=125
Reply from 10.130.0.200: bytes=32 time=1ms TTL=125
Reply from 10.130.0.200: bytes=32 time=2ms TTL=125
Reply from 10.130.0.200: bytes=32 time<1ms TTL=125
Reply from 10.130.0.200: bytes=32 time=10ms TTL=125
Reply from 10.130.0.200: bytes=32 time=11ms TTL=125
Reply from 10.130.0.200: bytes=32 time=10ms TTL=125
Reply from 10.130.0.200: bytes=32 time=10ms TTL=125
Reply from 10.130.0.200: bytes=32 time=10ms TTL=125

Ping statistics for 10.130.0.200:
    Packets: Sent = 76, Received = 69, Lost = 7 (10% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 57ms, Average = 9ms

Control-C
^C
C:\>tracert 10.130.0.200

Tracing route to 10.130.0.200 over a maximum of 30 hops:

  1    0 ms      24 ms      0 ms      10.128.6.1
  2    0 ms      0 ms       0 ms      10.128.255.2
  3    1 ms      0 ms       0 ms      10.128.255.10
  4    10 ms     1 ms       10 ms     10.130.0.200

Trace complete.
```

```
provider-kim-sw-1(config)#vlan 6
provider-kim-sw-1(config-vlan)#
%LINK-5-CHANGED: Interface Vlan6, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan6, changed state to up

provider-kim-sw-1(config-vlan)#name sochi
provider-kim-sw-1(config-vlan)#^Z
provider-kim-sw-1#
%SYS-5-CONFIG_I: Configured from console by console

provider-kim-sw-1#wr m
Building configuration...
[OK]
```

```
Reply from 10.130.0.200: bytes=32 time<1ms TTL=125
Reply from 10.130.0.200: bytes=32 time=2ms TTL=125
Reply from 10.130.0.200: bytes=32 time<1ms TTL=125
Reply from 10.130.0.200: bytes=32 time<1ms TTL=125
Reply from 10.130.0.200: bytes=32 time=10ms TTL=125

Ping statistics for 10.130.0.200:
    Packets: Sent = 11, Received = 11, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 10ms, Average = 2ms

Control-C
^C
C:\>tracert 10.130.0.200

Tracing route to 10.130.0.200 over a maximum of 30 hops:

  1    1 ms      0 ms      0 ms      10.128.6.1
  2    11 ms     1 ms      0 ms      10.128.255.10
  3    0 ms      5 ms      10 ms     10.130.0.200

Trace complete.
```

Вывод

Настроила динамическую маршрутизацию между территориями организации.

Спасибо за внимание!