

МИНИСТЕРСТВО НАУКИ И ВЫСШЕГО ОБРАЗОВАНИЯ РОССИЙСКОЙ ФЕДЕРАЦИИ  
федеральное государственное бюджетное образовательное учреждение  
высшего образования  
«Российский экономический университет имени Г.В. Плеханова»  
**Московский приборостроительный техникум**

### **ЛАБОРАТОРНАЯ РАБОТА №11**

**Тема:** «настройка протоколов HSRP и GLBP»

МДК.01.02 «Организация, принципы построения и функционирования  
компьютерных сетей»

**Выполнил:**

Карпов А. В.

студент группы СА50 – 1 – 22

**Проверил:**

Холькин В. И.

преподаватель ФГБОУ ВПО «РЭУ им. Г.В. Плеханова»

# Отчет о выполненной работе по настройке и проверке стандартных ACL-списков

## Ход работы:

### Часть 1: Построение сети и проверка соединения

#### 1. Топология сети

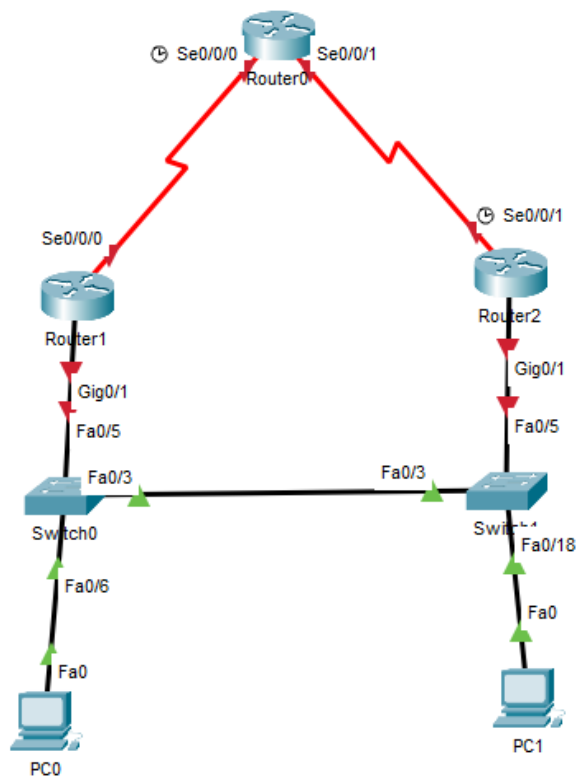


Рис. 1 – топология сети

#### 2. Базовая настройка устройств

```
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname KarpovR1
KarpovR1(config)#enable password cisco
KarpovR1(config)#username admin password cisco
KarpovR1(config)#line console 0
KarpovR1(config-line)#password cisco
KarpovR1(config-line)#login
KarpovR1(config-line)#line vty 0 15
KarpovR1(config-line)#password cisco
KarpovR1(config-line)#login
KarpovR1(config-line)#transport input all
KarpovR1(config-line)#service password-encryption
KarpovR1(config)#banner motd "Hello R1"
KarpovR1(config)#
```

Рис. 2 – базовая настройка

### 3. Настройка интерфейсов на маршрутизаторе R1

```
KarpovR1(config)#int g0/1
KarpovR1(config-if)#ip add 192.168.1.1 255.255.255.0
KarpovR1(config-if)#int s0/0/0
KarpovR1(config-if)#ip add 10.1.1.1 255.255.255.252
KarpovR1(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down
KarpovR1(config-if)#
KarpovR1(config-if)#int g0/1
KarpovR1(config-if)#no sh

KarpovR1(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up
```

Рис. 3 – настройка IP R1

### 4. Настройка интерфейсов на маршрутизаторе R2

```
KarpovR2(config)#int s0/0/0
KarpovR2(config-if)#ip add 10.1.1.2 255.255.255.252
KarpovR2(config-if)#no sh

KarpovR2(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

KarpovR2(config-if)#int s0/0/1
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up

KarpovR2(config-if)#int s0/0/1
KarpovR2(config-if)#ip add 10.2.2.2 255.255.255.252
KarpovR2(config-if)#no sh

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down
KarpovR2(config-if)#
KarpovR2(config-if)#int lo 1

KarpovR2(config-if)#
%LINK-5-CHANGED: Interface Loopback1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Loopback1, changed state to up

KarpovR2(config-if)#ip add 209.165.200.225 255.255.255.224
KarpovR2(config-if)#
```

Рис. 4 – настройка IP R2

### 5. Настройка интерфейсов на маршрутизаторе R3

```

KarpovR3(config)#int g0/1
KarpovR3(config-if)#ip add 192.168.1.3 255.255.255.0
KarpovR3(config-if)#no sh

KarpovR3(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

KarpovR3(config-if)#int s0/0/1
KarpovR3(config-if)#ip add 10.2.2.1 255.255.255.252
KarpovR3(config-if)#no sh

KarpovR3(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/1, changed state to up

KarpovR3(config-if)#

```

---

Рис. 5 – настройка IP R3

## 6. Настройка коммутатора S1

```

KarpovS1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KarpovS1(config)#int vlan 1
KarpovS1(config-if)#ip add 192.168.1.11 255.255.255.0
KarpovS1(config-if)#no sh

KarpovS1(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

KarpovS1(config-if)#ex
KarpovS1(config)#ip def
KarpovS1(config)#ip default-gateway 192.168.1.1
KarpovS1(config)#

```

---

Рис. 6 – настройка S1

## 7. Настройка коммутатора S3

```

KarpovS3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
KarpovS3(config)#int vlan 1
KarpovS3(config-if)#ip add 192.168.1.13 255.255.255.0
KarpovS3(config-if)#no sh

KarpovS3(config-if)#
%LINK-5-CHANGED: Interface Vlan1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to up

KarpovS3(config-if)#ex
KarpovS3(config)#ip def
KarpovS3(config)#ip default-gateway 192.168.1.3
KarpovS3(config)#

```

---

Рис. 7 – настройка S3

## 8. Настройка компьютеров IP

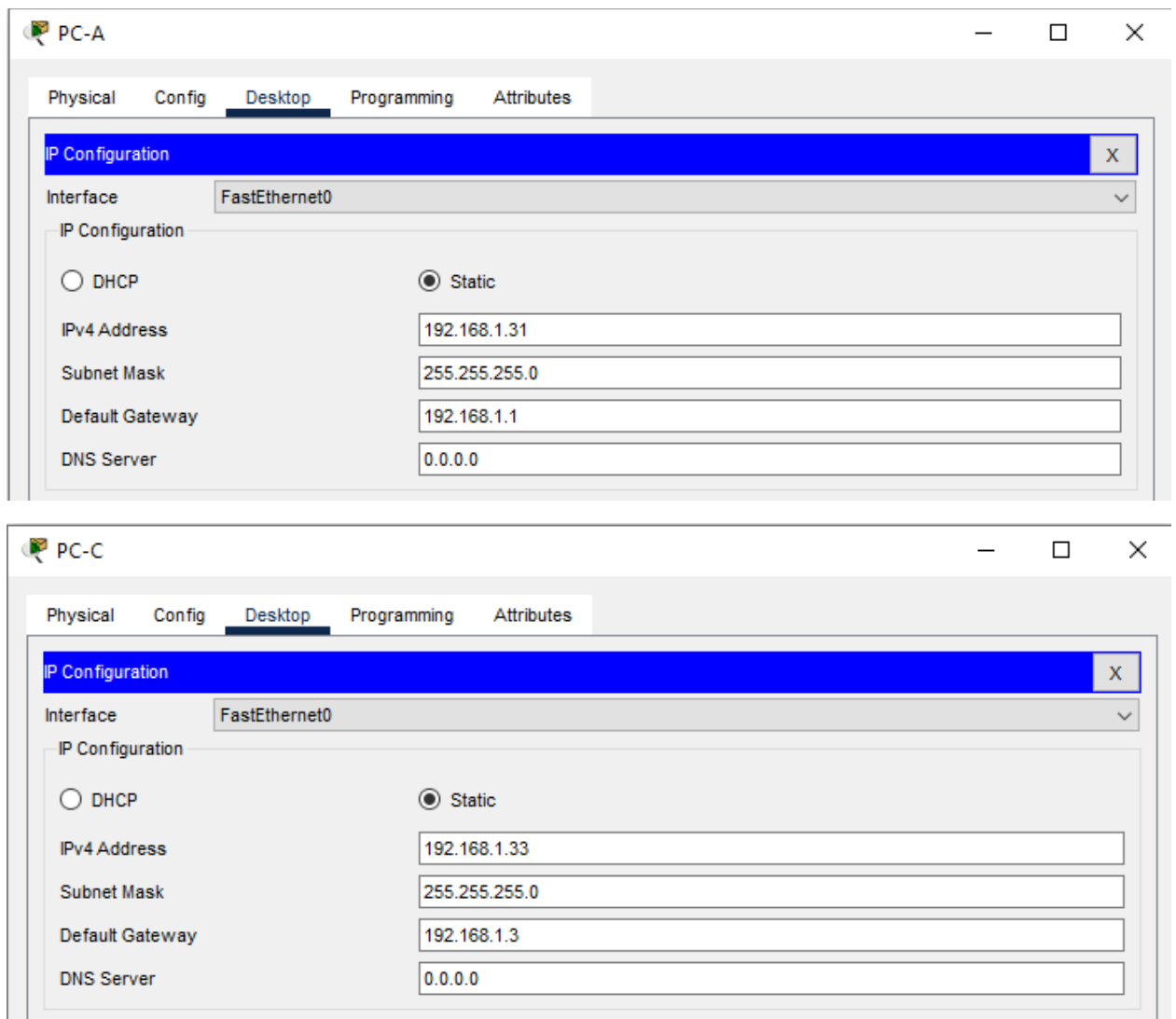


Рис. 8 – настройка PC-A

## 9. Проверка эхо запросом PC-A – PC-C

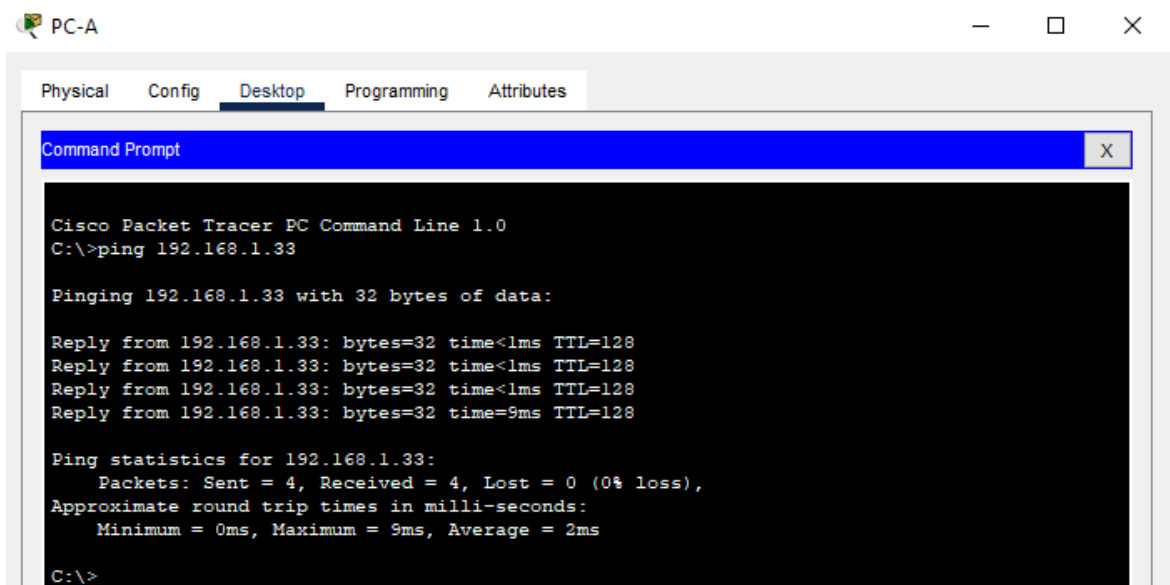


Рис. 9 – проверка

## 10. Настройки маршрутизации на R1 OSPF

```
Enter configuration commands, one per line. End with CNTL/Z.
KarpovR1(config)#router ospf 1
KarpovR1(config-router)#net
KarpovR1(config-router)#network 192.168.1.0 255.255.255.0 area 0
KarpovR1(config-router)#network 10.1.1.0 255.255.255.252 area 0
KarpovR1(config-router)#
```

---

Рис. 10 – настройка OSPF

## 11. Настройки OSPF на R2

```
KarpovR2(config)#router ospf 1
KarpovR2(config-router)#net
KarpovR2(config-router)#network 10.1.1.0 255.255.255.252 area 0
KarpovR2(config-router)#network 10.2.2.0 255.255.255.252 area 0
KarpovR2(config-router)#
00:37:18: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on Serial0/0/0 from LOADING to FULL,
Loading Done

KarpovR2(config-router)#net
KarpovR2(config-router)#network 209.165.200.225 255.255.255.224 area 0
KarpovR2(config-router)#
```

---

Рис. 11 – настройка OSPF

## 12. Настройка OSPF на R3

```
Enter configuration commands, one per line. End with CNTL/Z.
KarpovR3(config)#router ospf 1
KarpovR3(config-router)#net
KarpovR3(config-router)#network 192.168.1.0 255.255.255.0 area 0
KarpovR3(config-router)#
00:41:03: %OSPF-5-ADJCHG: Process 1, Nbr 192.168.1.1 on GigabitEthernet0/1 from LOADING
to FULL, Loading Done

KarpovR3(config-router)#network 10.2.2.0 255.255.255.252 area 0
KarpovR3(config-router)#
```

Рис. 12 – настройка OSPF

## Часть 2: Настройка обеспечения избыточности на первом хопе с помощью HSRP

### 13. Определил путь интернет-трафика для PC-A и PC-C.

```
C:\>
C:\>tracert 209.165.200.225

Tracing route to 209.165.200.225 over a maximum of 30 hops:

  1  0 ms      0 ms      0 ms      192.168.1.1
  2  1 ms      *          1 ms      209.165.200.225

Trace complete.

C:\>
```

Рис. 13 – путь трафика

### 14. Настройка HSRP на R1 и R3.

```

KarpovR1(config)#int g0/1
KarpovR1(config-if)#standby 1 ip 192.168.1.254
KarpovR1(config-if)#standby 1 prio
KarpovR1(config-if)#standby 1 priority 150
KarpovR1(config-if)#standby 1 pre
KarpovR1(config-if)#standby 1 preempt
KarpovR1(config-if)#
%HSRP-6-STATECHANGE: GigabitEthernet0/1 Grp 1 state Speak -> Standby

%HSRP-6-STATECHANGE: GigabitEthernet0/1 Grp 1 state Standby -> Active

KarpovR1(config-if)#

```

---

```

KarpovR3(config)#int g0/1
KarpovR3(config-if)#stan
KarpovR3(config-if)#standby 1 ip 192.168.1.254
KarpovR3(config-if)#

```

Рис. 14 – настройка HSRP

## 15. Проверка HSRP

<pre> KarpovR3#show standby GigabitEthernet0/1 - Group 1 State is Standby   3 state changes, last state change 00:50:21 Virtual IP address is 192.168.1.254 Active virtual MAC address is 0000.0C07.AC01 Local virtual MAC address is 0000.0C07.AC01 (vl default) Hello time 3 sec, hold time 10 sec Next hello sent in 2.845 secs Preemption disabled Active router is 192.168.1.1 Standby router is local Priority 100 (default 100) Group name is hsrp-Gig0/1-1 (default) KarpovR3# </pre>	<pre> KarpovR1#show standby GigabitEthernet0/1 - Group 1 State is Active   4 state changes, last state change 00:48:26 Virtual IP address is 192.168.1.254 Active virtual MAC address is 0000.0C07.AC01 Local virtual MAC address is 0000.0C07.AC01 (vl default) Hello time 3 sec, hold time 10 sec Next hello sent in 1.622 secs Preemption enabled Active router is local Standby router is 192.168.1.3 Priority 150 (configured 150) Group name is hsrp-Gig0/1-1 (default) KarpovR1# </pre>
---	--

Рис. 15 – проверка

## 16. Сводка состояния

<pre> KarpovR1#show standby brief P indicates configured to preempt. </pre> <table border="1"> <thead> <tr> <th>Interface</th> <th>Grp</th> <th>Pri</th> <th>P</th> <th>State</th> <th>Active</th> <th>Standby</th> <th>Virtual IP</th> </tr> </thead> <tbody> <tr> <td>Gig0/1</td> <td>1</td> <td>150</td> <td>P</td> <td>Active</td> <td>local</td> <td>192.168.1.3</td> <td>192.168.1.254</td> </tr> </tbody> </table> <pre> KarpovR1# </pre>	Interface	Grp	Pri	P	State	Active	Standby	Virtual IP	Gig0/1	1	150	P	Active	local	192.168.1.3	192.168.1.254	<pre> KarpovR3#show standby brief P indicates configured to preempt. </pre> <table border="1"> <thead> <tr> <th>Interface</th> <th>Grp</th> <th>Pri</th> <th>P</th> <th>State</th> <th>Active</th> <th>Standby</th> <th>Virtual IP</th> </tr> </thead> <tbody> <tr> <td>Gig0/1</td> <td>1</td> <td>100</td> <td></td> <td>Standby</td> <td>192.168.1.1</td> <td>local</td> <td>192.168.1.254</td> </tr> </tbody> </table> <pre> KarpovR3# </pre>	Interface	Grp	Pri	P	State	Active	Standby	Virtual IP	Gig0/1	1	100		Standby	192.168.1.1	local	192.168.1.254
Interface	Grp	Pri	P	State	Active	Standby	Virtual IP																										
Gig0/1	1	150	P	Active	local	192.168.1.3	192.168.1.254																										
Interface	Grp	Pri	P	State	Active	Standby	Virtual IP																										
Gig0/1	1	100		Standby	192.168.1.1	local	192.168.1.254																										

Рис. 16 – состояние

Вывод: была выполнена лабораторная работа на тему настройке HSRP