

Лабораторная работа №7

Дисциплина: Сетевые технологии

Бахи сиди али темассини

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Содержание I

1 Цель работы

- Настройка службы DHCP
- Распределение адресов IPv4 и IPv6
- Анализ DHCP-трафика

2 Топология и захват трафика (IPv4 DHCP)

- Переименование устройств по шаблону
- PC1-bahis, bahis-sw-01, bahis-gw-01
- Включён захват трафика между коммутатором и маршрутизатором



Рисунок 1: Топология сети в GNS3 с переименованными устройствами и включённым захватом трафика

3 Системные параметры VyOS и пользователи

- Задано имя маршрутизатора
- Настроено доменное имя
- Создан пользователь bahis
- Удалён пользователь vyos

```
bahi@bahi-gw-01:~$ configure
WARNING: You are currently configuring a live-ISO environment, changes will not persist
[edit]
bahi@bahi-gw-01# delete system login user vyos
[edit]
bahi@bahi-gw-01# commit
[edit]
bahi@bahi-gw-01# save
Saving configuration to '/config/config.boot'...
Done
[edit]
bahi@bahi-gw-01#
```

4 Настройка DHCP-сервера (IPv4)

- Создан shared-network bahis
- DNS: 10.0.0.1
- Gateway: 10.0.0.1
- Диапазон: 10.0.0.2–10.0.0.253

```
1.netahi-gw-01# set service dhcp-server shared-network-name bahi domain-name ba
edit]
0.0.1ahi-gw-01# set service dhcp-server shared-network-name bahi name-server 10
edit]
/24@bahi-gw-01# set service dhcp-server shared-network-name bahi subnet 10.0.0.
edit]
/24 default-router 10.0.0.1 dhcp-server shared-network-name bahi subnet 10.0.0.
edit]
/24 range hosts start 10.0.0.2cp-server shared-network-name bahi subnet 10.0.0.
edit]
/24 range hosts stop 10.0.0.253p-server shared-network-name bahi subnet 10.0.0.
edit]
```

Рисунок 2: Конфигурация DHCP-сервера на маршрутизаторе VyOS для сети 10.0.0.0/24



5 Статистика DHCP-сервера (до клиентов)

- Всего адресов: 252
- Активных аренд: 0
- Все адреса доступны

```
bahi@bahi-gw-01:~$ show dhcp server statistics
Pool      Size     Leases   Available  Usage
-----
bahi        252       0         252  0%
bahi@bahi-gw-01:~$ show dhcp server leases
IP address  Hardware address  State    Lease start  Lease expiration  Remaining  Pool  H
name
-----
bahi@bahi-gw-01:~$ █
```

Рисунок 3: Статистика DHCP-сервера и отсутствие активных аренд IP-адресов

6 DHCP-процесс на узле PC1 (Request / ACK)

- DHCP Request
- DHCP ACK
- Назначен IP 10.0.0.2/24

```
Option 12: Host Name = PC1-bahi
Option 61: Client Identifier = Hardware Type=Ethernet MAC Address = 00:50:79:66:68:00

Opcode: 2 (REPLY)
Client IP Address: 0.0.0.0
Your IP Address: 10.0.0.2
Server IP Address: 0.0.0.0
Gateway IP Address: 0.0.0.0
Client MAC Address: 00:50:79:66:68:00
Option 53: Message Type = Offer
Option 54: DHCP Server = 10.0.0.1
Option 51: Lease Time = 86400
Option 1: Subnet Mask = 255.255.255.0
Option 3: Router = 10.0.0.1
Option 6: DNS Server = 10.0.0.1
Option 15: Domain = bahi.net

Opcode: 1 (REQUEST)
Client IP Address: 10.0.0.2
Your IP Address: 0.0.0.0
Server IP Address: 0.0.0.0
Gateway IP Address: 0.0.0.0
Client MAC Address: 00:50:79:66:68:00
Option 53: Message Type = Request
Option 54: DHCP Server = 10.0.0.1
Option 50: Requested IP Address = 10.0.0.2
Option 61: Client Identifier = Hardware Type=Ethernet MAC Address = 00:50:79:66:68:00
Option 12: Host Name = PC1-bahi

Opcode: 2 (REPLY)
Client IP Address: 10.0.0.2
Your IP Address: 10.0.0.2
```

7 Проверка IP и связности PC1

- IP получен по DHCP
- Gateway: 10.0.0.1
- Ping маршрутизатора успешен

```
PC1-bahi> show ip

NAME          : PC1-bahi[1]
IP/MASK       : 10.0.0.2/24
GATEWAY       : 10.0.0.1
DNS           : 10.0.0.1
DHCP SERVER   : 10.0.0.1
DHCP LEASE    : 86359, 86400/43200/75600
DOMAIN NAME   : bahi.net
MAC           : 00:50:79:66:68:00
LPORT          : 20004
RHOST:PORT    : 127.0.0.1:20005
MTU           : 1500
```



8 DHCP-статистика после выдачи адреса

- Активных аренд: 1
- IP: 10.0.0.2
- Клиент: PC1-bahis

```
-vbash: /config/dhcpd.leases: Permission denied
bahi@bahi-gw-01:~$ show dhcp server statistics
Pool      Size     Leases    Available   Usage
-----  -----
bahi       252        0        252   0%
bahi@bahi-gw-01:~$ show dhcp server leases
IP address      Hardware address      State      Lease start      Lease expiration      Remaining      Pool      Host
name
-----
bahi@bahi-gw-01:~$ show dhcp server statistics
Pool      Size     Leases    Available   Usage
-----  -----
bahi       252        1        251   0%
bahi@bahi-gw-01:~$ show dhcp server leases
IP address      Hardware address      State      Lease start      Lease expiration      Remaining      Pool
Host name
```

9 Журнал DHCP-сервера

- DHCPDISCOVER
- DHCPOFFER
- DHCPREQUEST
- DHCPACK
- Обслуживание клиента PC1

```
bahi@bahi-gw-01:~$ show log | grep dhcp
Jan 23 13:44:50 sudo[2316]:      root : TTY=unknown ; PWD=/ ; USER=root ; COMMAND=/usr/bin/sh -c /usr/sbin/vyshim /usr/libexec/vyos/conf_mode/dhcp_server.py
Jan 23 13:44:50 vyos-configd[682]: Received message: {"type": "node", "data": "/usr/libexec/vyos/conf_mode/dhcp_server.py"}
Jan 23 13:44:58 dhcpd[2346]: Wrote 0 leases to leases file.
Jan 23 13:44:58 dhcpd[2346]: Lease file test successful, removing temp lease file: /config/dhcpd.leases
.1769175898
Jan 23 13:44:58 dhcpd[2348]: Wrote 0 leases to leases file.
Jan 23 13:44:59 dhcpd[2348]:
Jan 23 13:44:59 dhcpd[2348]: No subnet declaration for eth2 (no IPv4 addresses).
Jan 23 13:44:59 dhcpd[2348]: ** Ignoring requests on eth2. If this is not what
Jan 23 13:44:59 dhcpd[2348]: you want, please write a subnet declaration
Jan 23 13:44:59 dhcpd[2348]: in your dhcpd.conf file for the network segment
Jan 23 13:44:59 dhcpd[2348]: to which interface eth2 is attached. **
Jan 23 13:44:59 dhcpd[2348]:
Jan 23 13:44:59 dhcpd[2348]:
Jan 23 13:44:59 dhcpd[2348]: No subnet declaration for eth1 (no IPv4 addresses).
Jan 23 13:44:59 dhcpd[2348]: ** Ignoring requests on eth1. If this is not what
Jan 23 13:44:59 dhcpd[2348]: you want, please write a subnet declaration
Jan 23 13:44:59 dhcpd[2348]: in your dhcpd.conf file for the network segment
Jan 23 13:44:59 dhcpd[2348]: to which interface eth1 is attached. **
```

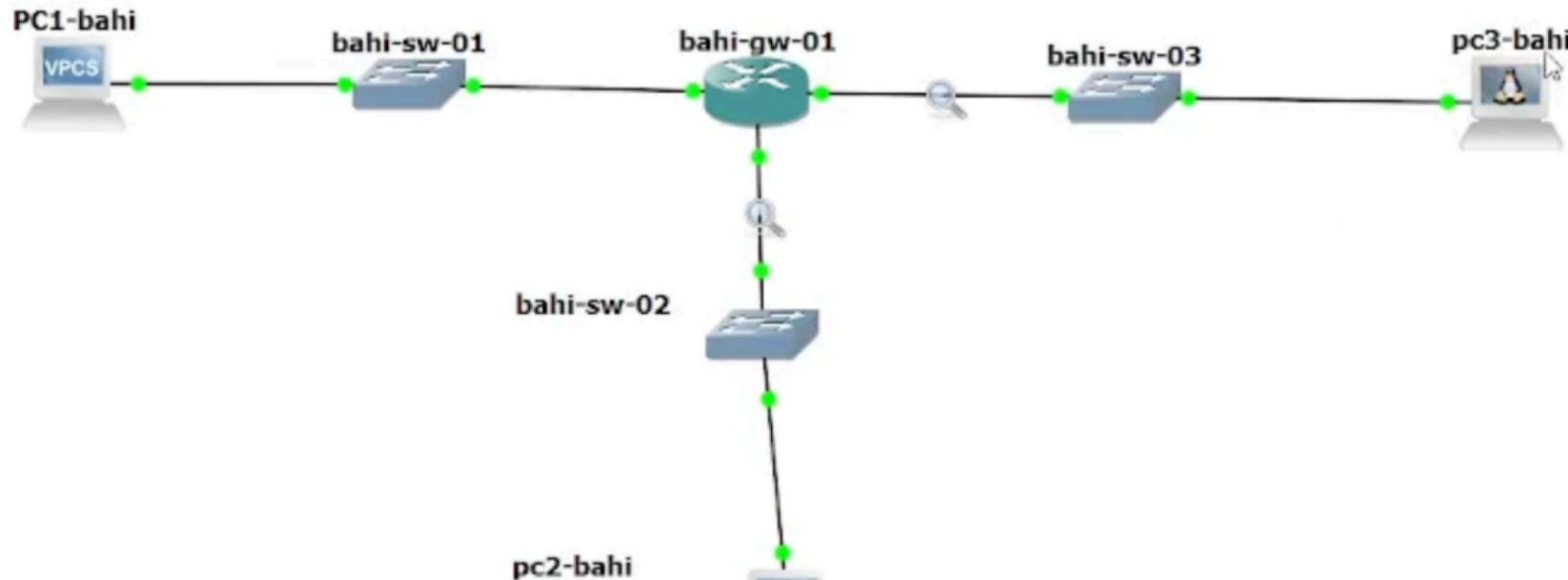


10 Анализ DHCP-трафика (IPv4)

- Discover → Offer → Request → ACK
 - ARP и Gratuitous ARP
 - ICMP Echo

11 IPv6: топология и захват трафика

- Использован Alpine Linux
- Захват ICMPv6 и DHCPv6
- Подсети IPv6



12 Системные параметры VyOS (IPv6)

- Имя устройства
- Доменное имя
- Пользователь bahis

```
[edit]
vyos@vyos#
[edit]
vyos@vyos#
[edit]
vyos@vyos# set system domain-name bahi.net
[edit]
vyos@vyos#
[edit]
vyos@vyos# set system login user bahi authentication plaintext
[edit]
vyos@vyos# commit
[edit]
vyos@vyos# save
Saving configuration to '/config/config.boot'...
Done
[edit]
vyos@vyos# exit
exit
vyos@vyos:~$ exit
logout

Welcome to VyOS - bahi-gw-01 ttyS0

bahi-gw-01 login: bahi
```



13 Назначение IPv6-адресов интерфейсам

- eth1: 2000 :: 1/64
- eth2: 2001 :: 1/64

```
bahi@bahi-gw-01:~$ configure
WARNING: You are currently configuring a live-ISO environment, changes will not persist until installed
[edit]
bahi@bahi-gw-01# delete system login user vyos
[edit]
bahi@bahi-gw-01# commit
[edit]
bahi@bahi-gw-01# save
Saving configuration to '/config/config.boot'...
Done
[edit]
bahi@bahi-gw-01# set interfaces ethernet eth1 address 2000::1/64
[edit]
bahi@bahi-gw-01# set interfaces ethernet eth2 address 2001::1/64
[edit]
bahi@bahi-gw-01# show interfaces
ethernet eth0 {
    hw-id 0c:fd:55:1c:00:00
}
ethernet eth1 {
+    address 2000::1/64
    hw-id 0c:fd:55:1c:00:01
}
ethernet eth2 {
+    address 2001::1/64
```



14 Stateless DHCPv6 + Router Advertisement

- SLAAC
- other-config-flag
- DNS и домен по DHCPv6

```
bahi@bahi-gw-01# save
Saving configuration to '/config/config.boot'...
Done
[edit]
bahi@bahi-gw-01# set service router-advert interface eth1 prefix 2000::/64
[edit]
bahi@bahi-gw-01# set service router-advert interface eth1 other-config-flag
[edit]
bahi@bahi-gw-01# set service dhcipv6-server shared-network-name bahi-stateless
[edit]
bnet 2000::0/64# set service dhcipv6-server shared-network-name bahi-stateless su
[edit]
mmon-options name-server 2000::1pv6-server shared-network-name bahi-stateless co
[edit]
bahi@bahi-gw-01#
[edit]
mmon-options domain-search bahi.net-server shared-network-name bahi-stateless co
```



15 Проверка IPv6 на PC2 (Stateless)

- SLAAC-адрес
- Link-local адрес
- Ping успешен

```
pc2-bahi console is now available... Press RETURN to get started.  
/ # ip address  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1000  
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00  
    inet 127.0.0.1/8 scope host lo  
        valid_lft forever preferred_lft forever  
    inet6 ::1/128 scope host  
        valid_lft forever preferred_lft forever  
6: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN qlen 1000  
    link/ether 02:42:e8:69:53:00 brd ff:ff:ff:ff:ff:ff  
    inet6 fe80::42:e8ff:fe69:5300/64 scope link  
        valid_lft forever preferred_lft forever  
/ # ip -6 route show  
fe80::/64 dev eth0 metric 256  
/ # /# ping 2000::1 -c 2  
/bin/sh: /#: not found  
/ # ping 2000::1 -c 2  
PING 2000::1 (2000::1): 56 data bytes  
ping: sendto: Network unreachable  
/ # cat /etc/resolv.conf  
/ # udhcpc6 -i eth0  
udhcpc6: started, v1.37.0  
udhcpc6: sending discover  
udhcpc6: sending discover  
udhcpc6: sending discover
```

16 Анализ IPv6-трафика (Stateless)

- Router Solicitation
- Router Advertisement
- DHCPv6 Solicit / Reply

No.	Time	Source	Destination	Protocol	Length	Info
27	11.. 2000:42:9bff:febb:db00		2000::1	ICMPv6	118	Echo (ping) request id=0x013c, seq=1, hop limit=64 (reply in 28)
28	11.. 2000:42:9bff:febb:db00		2000::42:9bff:febb:db00	ICMPv6	118	Echo (ping) reply id=0x013c, seq=1, hop limit=64 (request in 27)
29	11.. fe80::edf:93ff:fe:f5:1		2000::42:9bff:febb:db00	ICMPv6	86	Neighbor Solicitation for 2000::42:9bff:febb:db00 from 0c:df:93:f5:00:01
30	11.. 2000:42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	78	Neighbor Advertisement 2000::42:9bff:febb:db00 to 0c:df:93:f5:00:01 (sol)
31	11.. fe80::edf:93ff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	86	Neighbor Solicitation for fe80::edf:93ff:fe:f5:1 from 02:42:9b:bb:db:00
32	11.. fe80::edf:93ff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	78	Neighbor Advertisement fe80::edf:93ff:fe:f5:1 (rtr, sol)
33	12.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	ICMPv6	86	Neighbor Solicitation for fe80::42:9bff:febb:db00 from 0c:df:93:f5:00:01
34	12.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	78	Neighbor Advertisement fe80::42:9bff:febb:db00 (sol)
35	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	116	Solicit XID: 0x81ba6f [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
36	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Advertise XID: 0x81ba6f CID: 0003000102429bbdb00
37	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
38	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	134	Request XID: 0x81ba6f [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
39	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Reply XID: 0x81ba6f CID: 0003000102429bbdb00
40	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
41	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	182	Request XID: 0x81ba6f [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
42	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Reply XID: 0x81ba6f CID: 0003000102429bbdb00
43	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
44	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	86	Neighbor Solicitation for fe80::edf:93ff:fe:f5:1 from 02:42:9b:bb:db:00
45	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	ICMPv6	78	Neighbor Advertisement fe80::edf:93ff:fe:f5:1 (rtr, sol)
46	14.. fe80::edf:93ff:febb:db00		fe80::42:9bff:febb:db00	ICMPv6	86	Neighbor Solicitation for fe80::42:9bff:febb:db00 from 0c:df:93:f5:00:01
47	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	78	Neighbor Advertisement fe80::42:9bff:febb:db00 (sol)
48	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	182	Request XID: 0x81ba6f [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
49	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Reply XID: 0x81ba6f CID: 0003000102429bbdb00
50	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
51	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	182	Request XID: 0x81ba6f [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
52	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Reply XID: 0x81ba6f CID: 0003000102429bbdb00
53	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
54	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	182	Request XID: 0x81ba6f [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
55	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Reply XID: 0x81ba6f CID: 0003000102429bbdb00
56	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
57	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	116	Solicit XID: 0x8e266e [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00
58	14.. fe80::edf:93ff:fe:f5:1		fe80::42:9bff:febb:db00	DHC Pv6	162	Advertise XID: 0x8e266e CID: 0003000102429bbdb00
59	14.. fe80::42:9bff:febb:db00		fe80::edf:93ff:fe:f5:1	ICMPv6	210	Destination Unreachable (Port unreachable)
60	14.. fe80::42:9bff:febb:db00		ff02::1:2	DHC Pv6	134	Request XID: 0x8e266e [ROOT-ONLY DOMAIN NAME] CID: 0003000102429bbdb00

17 Настройка Stateful DHCPv6

- managed-flag
- Диапазон: 2001::100–2001::199
- DNS и домен

```
[edit]
net 2001::0/64 name-server 2001::16-server shared-network-name
[edit]
bnet 2001::0/64 domain-search bahi.netserver shared-network-name
[edit]
net 2001::0/64 address-range start 2001::100 stop 2001::199
[edit]
bahi@bahi-gw-01# commit
```

Рисунок 12: Конфигурация Stateful DHCPv6

18 Получение IPv6-адреса PC3

- До запроса: только link-local
- После udhcpc6: глобальный IPv6

```
PC3-alkamal console is now available... Press RETURN to get started.  
/ # ip address  
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1000  
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00  
    inet 127.0.0.1/8 scope host lo  
        valid_lft forever preferred_lft forever  
    inet6 ::1/128 scope host  
        valid_lft forever preferred_lft forever  
10: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN qlen 1000  
    link/ether 02:42:88:32:29:00 brd ff:ff:ff:ff:ff:ff  
    inet6 fe80::42:88ff:fe32:2900/64 scope link  
        valid_lft forever preferred_lft forever  
/ # ip -6 route show  
fe80::/64 dev eth0 metric 256  
/ # cat /etc/resolv.conf  
/ # udhcpc6 -i eth0  
udhcpc6: started, v1.37.0  
udhcpc6: sending discover  
udhcpc6: sending select  
udhcpc6: IPv6 obtained. lease time 43200
```

19 Проверка IPv6 PC3 после DHCPv6

- Глобальный IPv6
- Default route
- DNS получен

```
/ # ip address
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
        inet 127.0.0.1/8 scope host lo
            valid_lft forever preferred_lft forever
        inet6 ::1/128 scope host
            valid_lft forever preferred_lft forever
10: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UNKNOWN qlen 1000
    link/ether 02:42:88:32:29:00 brd ff:ff:ff:ff:ff:ff
        inet6 fe80::42:88ff:fe32:2900/64 scope link
            valid_lft forever preferred_lft forever
/ # ip -6 route show
fe80::/64 dev eth0 metric 256
/ # ping 2001::1 -c 2
PING 2001::1 (2001::1): 56 data bytes
ping: sendto: Network unreachable
/ # cat /etc/resolv.conf
search alkamal.net
nameserver 2001:0000:0000:0000:0000:0000:0001
/ #
```



20 Анализ DHCPv6 Stateful-трафика

- RA с managed-flag
- Solicit → Advertise → Request → Reply
- Адрес успешно выдан

No.	Time	Source	Destination	Protocol	Length	Info
1	0..	fe80::42:8bff:fe32:2900	ff02::2	ICMPv6	70	Router Solicitation from 02:42:88:32:29:00
2	94..	fe80::edf:93ff:fe5:2	ff02::16	ICMPv6	110	Multicast Listener Report Message v2
3	94..	fe80::edf:93ff:fe5:2	ff02::16	ICMPv6	110	Multicast Listener Report Message v2
4	10..	fe80::42:8bff:fe32:2900	ff02::1:2	DHCPv6	116	Solicit XID: 0xb0281f [ROOT-ONLY DOMAIN NAME] CID: 00030001024288322900
5	10..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	DHCPv6	179	Advertise XID: 0xb0281f IAA: 2001::199 CID: 00030001024288322900
6	10..	fe80::42:8bff:fe32:2900	ff02::1:ffff5:2	ICMPv6	86	Neighbor Solicitation for fe80::edf:93ff:fe5:2 from 02:42:88:32:29:00
7	10..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	ICMPv6	86	Neighbor Advertisement fe80::edf:93ff:fe5:2 (rtr, sol, ovr) is at 0c:df:93:f5:00:02
8	10..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	227	Destination Unreachable (Port unreachable)
9	10..	fe80::42:8bff:fe32:2900	ff02::1:2	DHCPv6	134	Request XID: 0xb0281f [ROOT-ONLY DOMAIN NAME] CID: 00030001024288322900
10	10..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	DHCPv6	179	Reply XID: 0xb0281f IAA: 2001::199 CID: 00030001024288322900
11	10..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	227	Destination Unreachable (Port unreachable)
12	10..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	ICMPv6	86	Neighbor Solicitation for fe80::42:8bff:fe32:2900 from 0c:df:93:f5:00:02
13	10..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	78	Neighbor Advertisement fe80::42:8bff:fe32:2900 (sol)
14	13..	fe80::edf:93ff:fe5:2	ff02::1	ICMPv6	86	Router Advertisement from 0c:df:93:f5:00:02
15	13..	fe80::edf:93ff:fe5:2	ff02::1	ICMPv6	86	Router Advertisement from 0c:df:93:f5:00:02
16	13..	fe80::42:8bff:fe32:2900	ff02::1:2	DHCPv6	116	Solicit XID: 0xbad27e [ROOT-ONLY DOMAIN NAME] CID: 00030001024288322900
17	13..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	DHCPv6	179	Advertise XID: 0xbad27e IAA: 2001::198 CID: 00030001024288322900
18	13..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	227	Destination Unreachable (Port unreachable)
19	13..	fe80::42:8bff:fe32:2900	ff02::1:2	DHCPv6	134	Request XID: 0xbad27e [ROOT-ONLY DOMAIN NAME] CID: 00030001024288322900
20	13..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	DHCPv6	179	Reply XID: 0xbad27e IAA: 2001::198 CID: 00030001024288322900
21	13..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	227	Destination Unreachable (Port unreachable)
22	13..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	86	Neighbor Solicitation for fe80::edf:93ff:fe5:2 from 02:42:88:32:29:00
23	13..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	ICMPv6	78	Neighbor Advertisement fe80::edf:93ff:fe5:2 (rtr, sol)
24	13..	fe80::edf:93ff:fe5:2	fe80::42:8bff:fe32:2900	ICMPv6	86	Neighbor Solicitation for fe80::42:8bff:fe32:2900 from 0c:df:93:f5:00:02
25	13..	fe80::42:8bff:fe32:2900	fe80::edf:93ff:fe5:2	ICMPv6	78	Neighbor Advertisement fe80::42:8bff:fe32:2900 (sol)
26	14..	fe80::edf:93ff:fe5:2	ff02::1	ICMPv6	86	Router Advertisement from 0c:df:93:f5:00:02
27	14..	fe80::42:8bff:fe32:2900	2001::1	ICMPv6	118	Echo (ping) request id=0x0157, seq=0, hop limit=64 (reply in 28)
28	14..	2001::1	fe80::42:8bff:fe32:2900	ICMPv6	118	Echo (ping) request id=0x0157, seq=0, hop limit=64 (request in 27)
29	14..	fe80::42:8bff:fe32:2900	2001::1	ICMPv6	118	Echo (ping) request id=0x0157, seq=1, hop limit=64 (reply in 30)
30	14..	2001::1	fe80::42:8bff:fe32:2900	ICMPv6	118	Echo (ping) reply id=0x0157, seq=1, hop limit=64 (request in 29)