

Tsinghua DHCPv4-over-v6 Configuration Guide

1. DHCP Server Configurations

1.1. Introduction

DHCPv4-over-IPv6 Server (TSV) can perform DHCPv4-over-IPv6 server side functionality. We have extended it to support the port-set option (current option code 224).

1.2. Basic Info

System Information:

Module	System	Notes
DHCPv4-over-IPv6 Server(TSV)	Linux	Based on dhcp-4.3.2-P2 from ISC

Interfaces Information:

- IPv4 Interface: eth0
- IPv6 Interface: eth1

1.3. TSV Configurations

Enter the directory of TC/dhcp/server/. There are two related configuration files: dhcpd.conf, open4v6-eth0.sh

1.3.1. dhcpd.conf

```
shared-network network4_eth0 {  
  subnet 219.243.208.192 netmask 255.255.255.224 {  
    option port-set 0x1234,0xF800;           →Set port set index &  
    mask                                         mask  
    option routers 219.243.208.193;           →Set the GW  
    option domain-name-servers 8.8.8.8;      →DNS server  
  }  
  pool {  
    range 219.243.208.197 219.243.208.197;   →addr pool  
    #range 219.243.208.209 219.243.208.209;  
  }  
}
```

PS:

About the line of 'option port-set 0x1234,0xF800;':

The first number is port-set index which is not the actually assigned port-set index but an arbitrary number

The second number is port-set mask which determines the length of the mask.

1.3.2. open4v6-eth0.sh

```
#!/bin/bash
```

```
rm -f dhcpd.leases      →Clear old leases
```

```
touch dhcpd.leases      →Create new dhcpd.leases file
```

```
./dhcpd -4v6 -4v6interface eth0 eth1 -p 67 -cf dhcpd.conf -lf dhcpd.leases -f
```

→The IPv4 address pool to be allocated (in dhcpd.conf file) should be in the same subnet with the IPv4 address of eth0.

→The eth1 is the IPv6 iface which the server listens on.

PS:

If you only have one Net Interface (for example eth0, both IPv4 interface and IPv6 interface on it), you can modify the open4v6-eth0.sh like this:

```
./dhcpd -4v6 -4v6interface eth0 eth0 -p 67 -cf dhcpd.conf -lf dhcpd.leases -f
```

1.4. Compile the system

- 1) Enter the directory of TC/tunnel/
- 2) make clean
- 3) rm ioctl
- 4) make (Compile the virtual NIC module)
- 5) make ioctl
- 6) Enter the directory of TC/dhcp
- 7) ./configure
- 8) make

1.5. Launch the system

- 1) Enter the directory of TC/dhcp/server/
- 2) sudo ./open4v6-eth0.sh

2. DHCP client + HCRA Configurations

2.1. Introduction

We use dhcpcd as the DHCP client and have modified it to support port-set option (current option code 224).

Dhcpcd and HCRA can perform DHCPv4-over-IPv6 client side functionality.

In address sharing scenario (i.e. port-set option is enabled), NAPT function is needed (see 2.5 for detail).

2.2. Basic Info

System Information:

Module	System	Notes
DHCPv4 client	Linux	dhcpcd
Client Relay Agent (CRA)	Linux	HCRA
NAPT	Linux	iptables

2.3. DHCPv4 client Configurations

There are directories used for dhcpcd, which are specified in dhcpcd/config.h .

Create related directories and put their paths in the config.h file. After that, run 'make clean' and then re-make the programs.

2.4. HCRA Usage

Enter the directory of TI/cra/, and start CRA using the shell with following options:

./cra OPTIONS

OPTIONS	DESCRIPTION
-h	Display the usage information.
-a IP6ADDR1 IP6ADDR2	Set the local IPv6 address with IP6ADDR1, and the IPv6 address of the remote TSV or TRA with IP6ADDR2.
-b IFNAME1	Set the name of the interface which uses the IP6ADDR1 as its IPv6 address with IFNAME1.
-c IFNAME2	Set the name of the interface on which the DHCP client runs with IFNAME2. Note that this interface can be the same interface as IFNAME1.
-d	Run the CRA with default settings, which are settled in the beginning of the source code :-)

2.5. NAPT Configurations

NAPT functionality is accomplished by using iptables.

- donat.sh

In the directory dhcpd/. It will be invoked automatically by dhcpd after the address and port-set is assigned successfully.

- offnat.sh

In the directory dhcpd/. It will be invoked automatically once the dhcpd process is killed to stop the NAT function.

2.6. Compile the system

- 1) Enter the directory of TI/cpe/tunnel/.
- 2) make clean
- 3) make
- 4) Modify the TI/dhcpd/config.h, than create related directories.
- 5) Enter the directory of TI/dhcpd/.
- 6) make

2.7. Launch the system

- 1) Enter the directory of TI/cra/.
- 2) Specify the IPv6 address of lwAFTR and lwB4 when running the CRA.
Supposing IPv6 address of lwB4 is 2001::2, while that of lwAFTR is 2001::1.

```
sudo ./cra -a 2001::2 2001::1
```
- 3) Enter the directory of TI/dhcpd/.
- 4)

```
sudo ./open4v6.sh
```