

# Tsinghua DHCPv4-over-v6 Configuration Guide

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## 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

\*Note that IPv4 and IPv6 interface could be the same one (i.e. both are eth0 or eth1). The 'eth0' and 'eth1' here are just for clarification.

### 1.3. TSV Configurations

Before you start to set up TSV, you should compile it first. Enter the path of TC/dhcp/, use the following commands to compile the TSV:

`$ ./configure`

`$ make clean`

`$ make`

In Enter the ~~path~~folder of TC/dhcp/server/~~-T~~ there are two related configuration files: dhcpd.conf, open4v6-eth0.sh. The open4v6-eth.sh is an executable script. See 1.4 for setting up the TSV.

#### 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  
    option routers 219.243.208.193;          →Set the GW  
    option domain-name-servers 8.8.8.8;     →DNS server  
  }  
  pool {
```

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```
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.
```

### 1.4. Launch the system

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

## 2. DHCP client + HCRA Configurations

### 2.1. Introduction

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

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

If you want to use the port-set option in address sharing scenario (i.e. port-set option is enabled), NAPT module function is needed (see 2.5 for detail).

### 2.2. Basic Info

System Information:

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

### 2.3. DHCPv4 client Configurations

There are ~~some specific directories~~ ~~folders~~ used ~~for by~~ dhcpcd, which are specified in dhcpcd/config.h .

Create related ~~\_folder~~ ~~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 ~~folder~~ ~~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 ~~folder~~ ~~directory~~ dhcpcd/. It will be invoked automatically by dhcpcd after the address and port-set is assigned successfully.

- offnat.sh

In the ~~folder~~ ~~directory~~ dhcpcd/. It will be invoked automatically once the dhcpcd process is killed to stop the NAPT function.

### 2.6. Launch the system

1) Enter the ~~folder~~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
```

\*Note that you can still specify other options if needed. See 2.4 for detail.

3) Enter the ~~folder~~directory of TI/dhcpd/.

4) `sudo ./open4v6.sh`