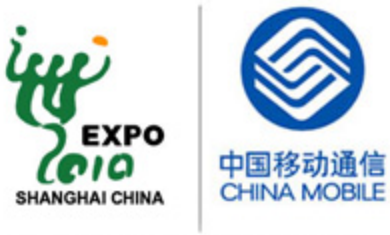
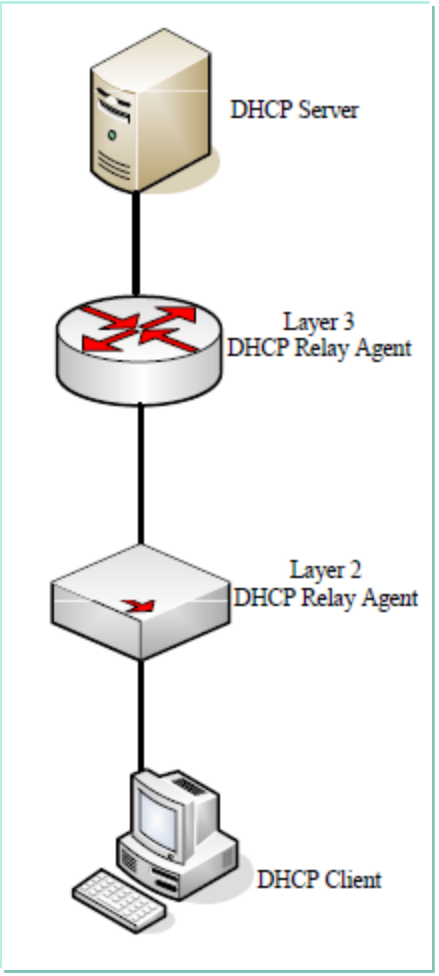


Progress of Relay Agent Encapsulation for DHCPv4

Nov.2011

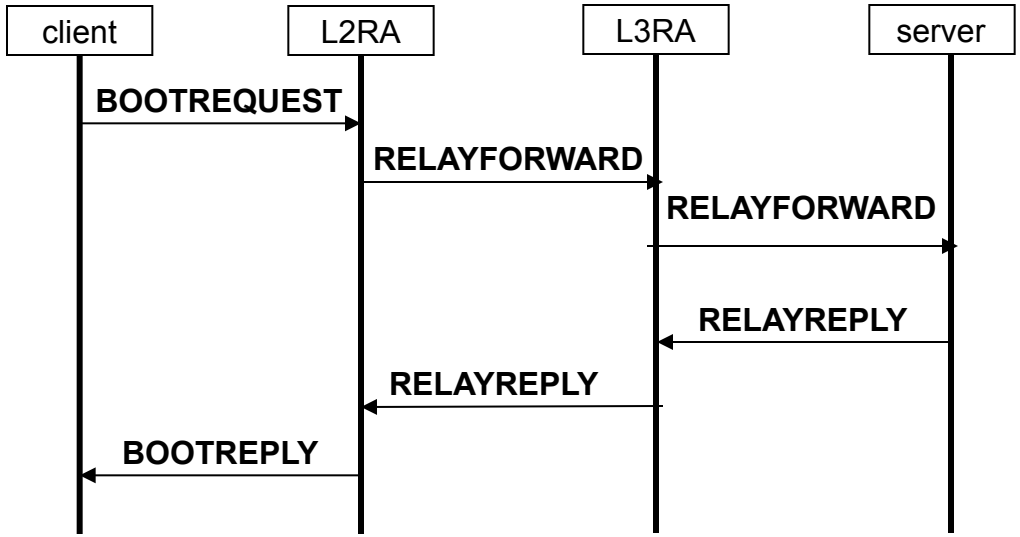
Status of current version

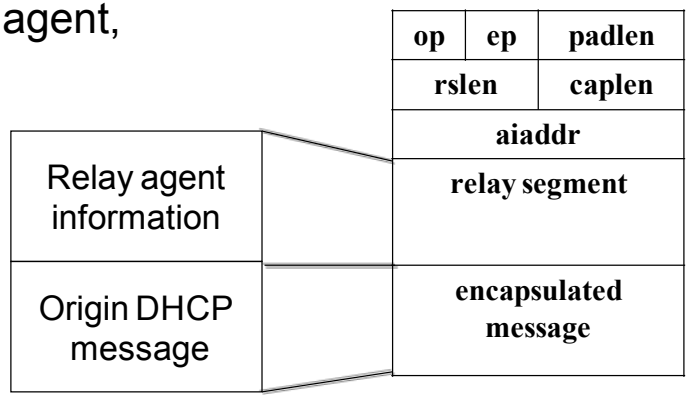


- draft-ietf-dhc-dhcpv4-relay-encapsulation-01
  - Define new messages to convey relay agent information:
    RELAYFORWARD, RELAYREPLY
  - Define relay agent behavior, including L2 relay agent and L3 relay agent
  - Define DHCP server behavior
  - No change on DHCP client behavior

Brief description of mechanism

(1) When DHCP message toward server go through a relay agent, RA encapsulate it into a new message, RELAYFORWARD message, and add its information in at the same time



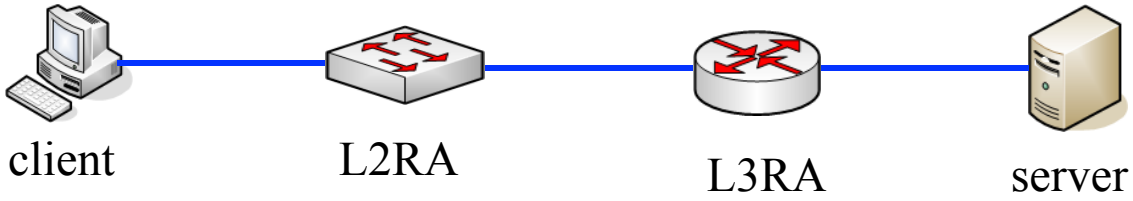


(2) DHCP server decapsulate RELAYFORWARD message and response a RELAYREPLY message

(3) When RELAYREPLY message go through a relay agent, RA decapsulate it to get the relative RA info and send a new RELAYREPLY message or a normal DHCP message if it's the closest RA to client

Implementation of Relay Agent Encapsulation for DHCPv4

- We build four hosts in VMware Workstation:

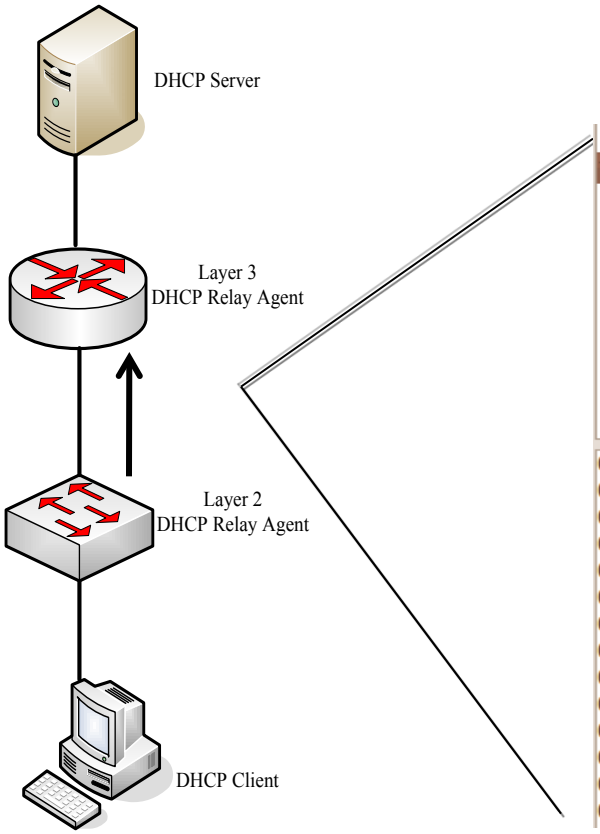


- We modify and run isc dhcp-4.2.0 version based on “draft-ietf-dhc-dhcpv4-relay-encapsulation-01” in three hosts for our experiment
  - L2RA
    - Encapsulate message into a new message
    - Add some sub-options into relay segment, such as Circuit ID, Link selection,and SUBOPT_L2AS if the L2RA is close to the client
    - Decapsulate RELAYREPLY message
  - L3RA
    - Encapsulate message into a new message
    - Add some sub-options into relay segment, such as Circuit ID, Link selection.
    - Decapsulate RELAYREPLY message
  - Server
    - Decapsulate RELAYFORWARD message
    - Construct RELAYREPLY message and send to relay agent

Implementation of Relay Agent Encapsulation for DHCPv4

- Experiment result (1)

L2RA constructs the RELAYFORWARD message by adding fixed-length header and relay segment.



Fixed-length header and relay segment

```
▷ User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)
▽ Bootstrap Protocol
    Message type: Relay Forwrad (3)
    Does end option prior to encapsulation ? : True
    The length of padding option: 0
    The length of relay segment: 28
    The length of encapsulated message: 300
    Relay Agent IP address: 0.0.0.0 (0.0.0.0)
  ▽ relay segment: 010465746839050 40a04040101000c29c21d3d010901000c...
    ▷ Sub option: (t=1,l=4) Circuit id = "eth9"
```

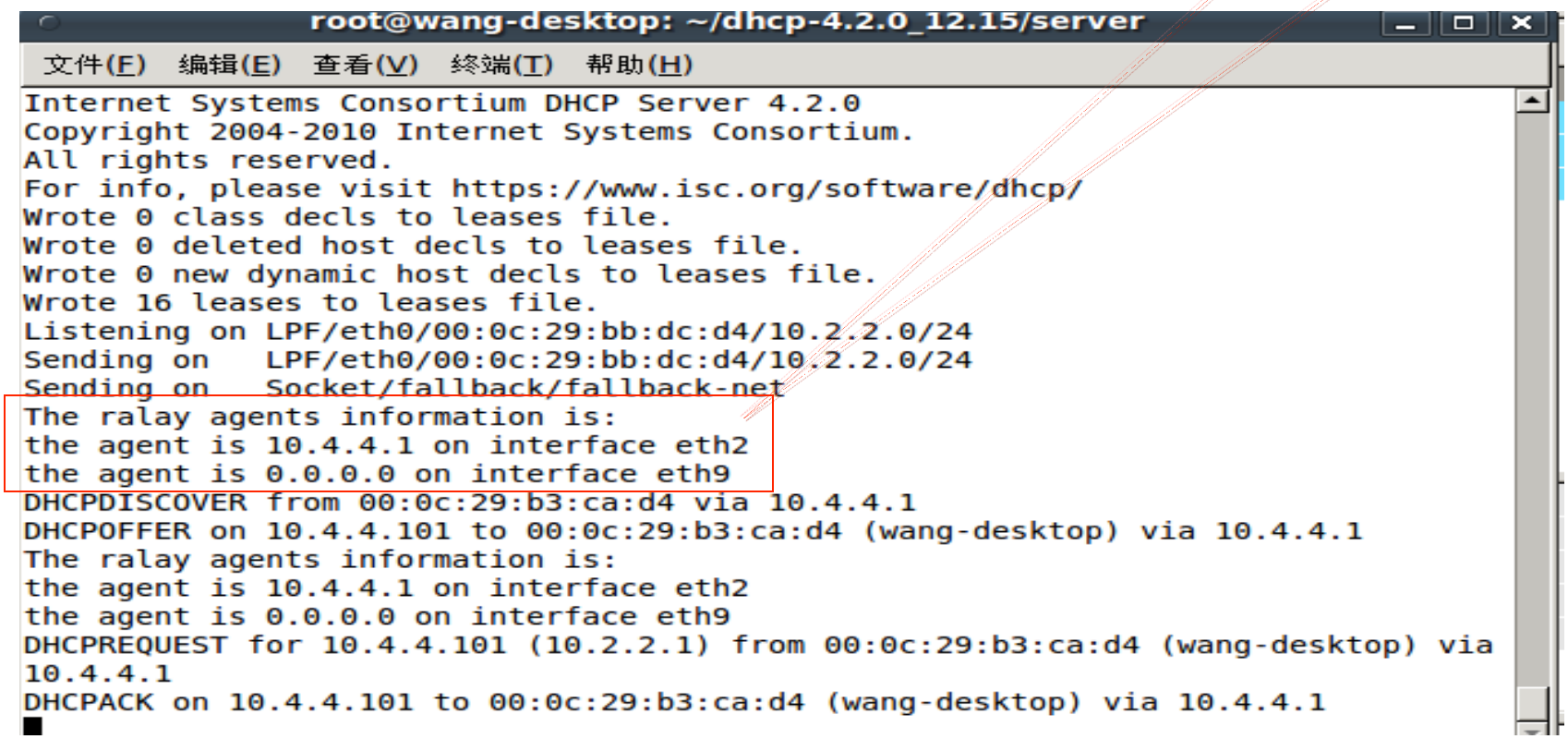
```
0000  ff ff ff ff ff ff 00 0c  29 c2 1d 33 08 00 45 10   ........ )..3..E.
0010  01 70 00 00 00 00 80 11  39 6e 00 00 00 00 ff ff   .p...... 9n......
0020  ff ff 00 43 00 43 01 5c  25 50 03 01 00 00 1c 00   ...C.C.\ %P......
0030  2c 01 00 00 00 00 01 04  65 74 68 39 05 04 0a 04   ,....... eth9....
0040  04 01 01 00 0c 29 c2 1d  3d 01 09 01 00 0c 29 b3   ..... )..  =.....).
0050  ca d4 01 01 06 01 fd 95  a7 24 00 00 00 00 00 00   ........ .$......
0060  00 00 00 00 00 00 00 00  00 00 0a 04 04 01 00 0c   ........ ........
0070  29 b3 ca d4 00 00 00 00  00 00 00 00 00 00 00 00   ).......  ........
0080  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
0090  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00a0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00b0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00c0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
00d0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00   ........ ........
```

Implementation of Relay Agent Encapsulation for DHCPv4

- Experiment result (2)

DHCP server could decapsulate RELAYFORWARD message and print all relay agents' information

The relay agents information on the path of DHCP discover



Request comments and fulfillment

- Please kindly help to review:

  draft-ietf-dhc-dhcpv4-relay-encapsulation-01

- Last time, there are two reviews suggested. Forget..

- Would any people or research entities like to fulfill this draft and make interoperation test with our demo? That will be helpful to find potential errors and push the work forward.

Thank You