The Server Range Option for DHCP
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1 Abstract

   This document describes a configuration option that may be used
   by hosts acting as IP forwarders. The option contains information
   about the networks adjacent to the host and may be required by
   routing protocols.

2 Requirements

   Throughout this document, the words that are used to define the
   significance of particular requirements are capitalized. These
   words are:

      o "MUST"

         This word or the adjective "REQUIRED" means that the
         item is an absolute requirement of this specification.

      o "MUST NOT"

         This phrase means that the item is an absolute prohibition
         of this specification.

      o "SHOULD"

This word or the adjective "RECOMMENDED" means that there
may exist valid reasons in particular circumstances to ignore
this item, but the full implications should be understood and
the case carefully weighed before choosing a different course.

3 Terminology

This document uses the following terms:

   o "DHCP client"

     A DHCP client is an Internet host using DHCP to obtain
     configuration parameters such as a network address.

   o "DHCP server"

     A DHCP server is an Internet host that returns configuration
     parameters to DHCP clients.

4 Server Range Option

Any client that is configured by DHCP[1] may act as an IP packet
forwarder. Depending on the network topology, the client may need to
participate in a routing protocol conversation with one or more
neighboring routers. Part of the input to this conversation is the
network that is served by the forwarding client. The attached
network can be a simple classless range derived from the IP address
and network mask supplied by the DHCP server to the client. Using
the mask to obtain just the network prefix, the client can advertise
this prefix in the routing protocol conversation.

The network served by a forwarding client, however, can be composed
of a series of subnets. Normally only one of these subnets is
reflected in the address assigned to a client's interface. The
purpose of the Server Range Option is to supply the set of IP
addresses that the DHCP server is serving to nearby hosts. From this
set of addresses, the forwarding client can derive the set of subnets
to advertise to its router neighbors. There are two possible
approaches to supplying the addresses. Experimentation will
determine which is most useful.

The code for this option is 111 and the length is a multiple of 8.

4.1. Address Range Approach

The option is built by the server as pairs of starting and ending IP
addresses, expressing ranges that can represent subnets. The client
may have to aggregate ranges to derive a subnet and its mask.

   Code Len   Start1-address   End1-address
  +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

```
       | 111 |  n  | s1  | s2  | s3  | s4  | e1  | e2  |  e3 | e4
       +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

                  Start2-address ...
              +-----+-----+
              | s1  | s2  |  . . .
              +-----+-----+
```

4.2 Prefix and Mask Approach

The option is build by the DHCP server as pairs of subnet prefixes
(padded with zeroes to 32 bits) and subnet masks. These are usable
directly by the client.

```
    Code  Len   Address-Prefix1          Mask1
   +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----
   | 111 |  n  | a1  | a2  | a3  | a4  | m1  | m2  |  m3 | m4
   +-----+-----+-----+-----+-----+-----+-----+-----+-----+-----

                  AddressPrefix2 ...
              +-----+-----+
              | a1  | a2  |  . . .
              +-----+-----+
```

5 References

[1] Droms, R., "Dynamic Host Configuration Protocol", RFC 1541,
    Bucknell University, October 1993.

[2] Alexander, S., and R. Droms, "DHCP Options and BOOTP Vendor
    Extensions", RFC 1533, Lachman Technology, Inc., Bucknell
    University, October 1993.

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