使用前缀委派功能配置 DHCPv6 的配置示例

目录

简介

本文介绍如何使用前缀委派功能来配置 DHCPv6（IPv6 动态主机配置协议）服务器和客户端。此功能可用于管理链路、子网和站点寻址更改。

在本文提供的配置示例中，我们为名为 *DHCPv6 server 的路由器启用了前缀委派功能，使其作为前缀委派路由器工作。* 该前缀委派路由器会自动执行为请求路由器（即 DHCP 客户端）分配前缀的过程。 当服务器向客户端委派前缀后，请求路由器上连接到本地局域网 (LAN) 的接口将使用收到的前缀块生成 IPv6 地址。然后，请求路由器会在路由器通告消息中通告该地址。客户端路由器（即本地局域网中的路由器）可以使用自动配置选项从 DHCP 客户端通告的路由器通告消息中提取全局 IP 地址。

先决条件

要求

尝试进行此配置之前，请确保满足以下要求：

- 具备与 IPv6 寻址和基本连接相关的知识
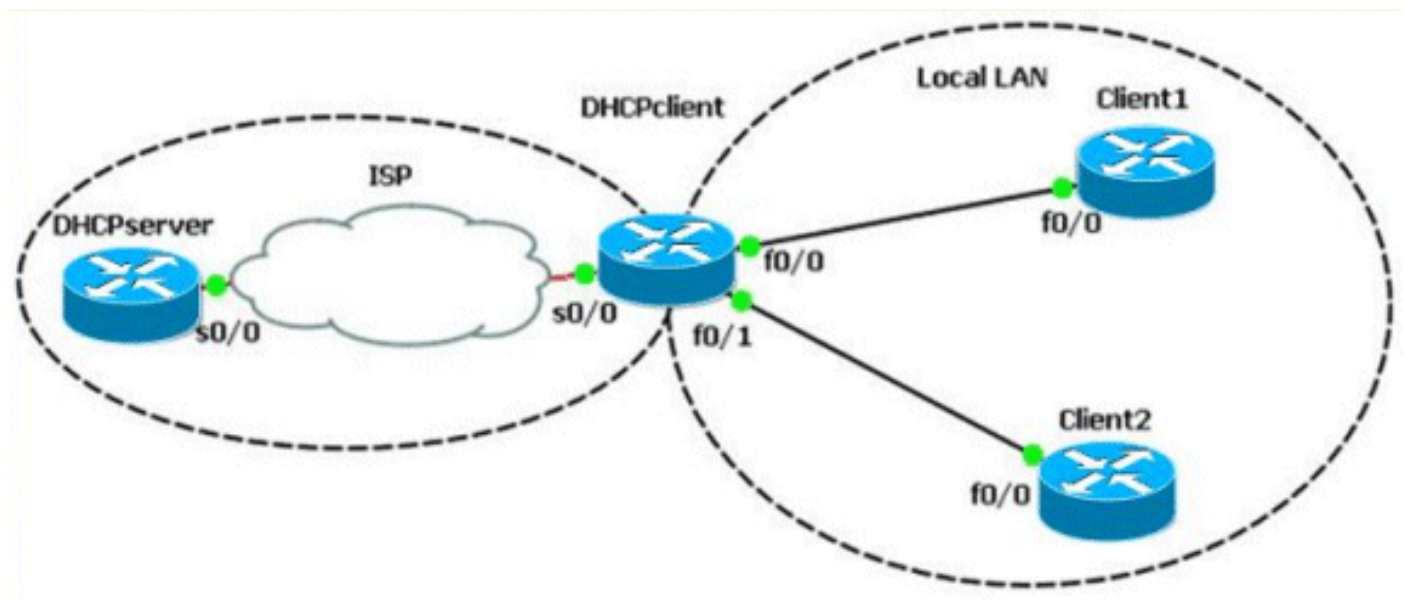- 具备与实施 IPv6 DHCP 相关的知识

使用的组件

本文档不限于特定的软件和硬件版本。

本文所述的配置基于运行 Cisco IOS® 软件版本 12.4(15)T13 的思科 3700 系列路由器。

配置

本部分提供有关如何配置本文档所述功能的信息。

网络图

本文档使用以下网络设置：

配置

本文档使用以下配置：

- DHCP 服务器配置
- DHCP 客户端配置
- 本地 LAN 客户端 1 和 2 配置

下面这段来自思科支持社区的 视频展示了在 Cisco IOS 路由器上配置 DHCPv6 的具体步骤：

在 Cisco IOS 中配置 DHCPv6

Configuration of DHCPv6 in Cisco IOS

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00:05/06:44

```
DHCPSERVER#show running-config

version 12.4
!
hostname DHCPSERVER
!
ipv6 unicast-routing
ipv6 dhcp pool dhcpv6
```
!--- The DHCP pool is named "dhcpv6." ! prefix-delegation pool dhcpv6-pool1 lifetime 1800 600 *!--- The prefix delegation pool name is "dhcpv6-pool1."* ! dns-server 2001:DB8:3000:3000::42
domain-name example.com ! interface Serial0/0 no ip address ipv6 address 2010:AB8:0:1::1/64 ipv6
enable ipv6 dhcp server dhcpv6 clock rate 2000000 ! ipv6 local pool dhcpv6-pool1
2001:DB8:1200::/40 48 *!--- The prefix pool named dhcpv6-pool1 has a prefix of length !--- /40
from which it will delegate (sub)prefixes of length /48.* ! end


```
DHCPCLIENT#show running-config

version 12.4
!
hostname DHCPCLIENT
!
ipv6 unicast-routing
!
interface Serial0/0
no ip address
ipv6 address autoconfig default
```
*!--- The autoconfig default adds a static ipv6 !--- default route pointing to upstream DHCP
server.* ! ipv6 enable ipv6 dhcp client pd prefix-from-provider *!--- The DHCP client prefix
delegation is !--- given the name prefix-from-provider.* ! clock rate 2000000 ! interface
FastEthernet0/0 no ip address duplex auto speed auto ipv6 address prefix-from-provider
::1:0:0:0:1/64 *!--- The first 48 bits are imported from the delegated !--- prefix
(2001:db8:1200) and the ::/64 is the client !--- identifier that gives the interface Fa0/1 the*

!--- global IPv6 address 2001:DB8:1200:1::1/64. ! ipv6 enable ! interface FastEthernet0/1 no ip address duplex auto speed auto ipv6 enable ipv6 address prefix-from-provider ::1/64 *!--- Similarly, the global IPv6 address !--- for fa0/1 is 2001:DB8:1200::1.* ! end

本地 LAN 配置
客户端 1   ### 客户端 2

```
CLIENT1#show running-config                      CLIENT2#show running-config

version 12.4                                     version 12.4
!                                                !
hostname CLIENT1                                 hostname CLIENT2
!                                                !
ipv6 unicast-routing                             ipv6 unicast-routing
!                                                !
interface FastEthernet0/0                        interface FastEthernet0/0
no ip address                                    no ip address
duplex auto                                      duplex auto
speed auto                                       speed auto
ipv6 address autoconfig                          ipv6 address autoconfig
!--- The clients can run autoconfig to get an IPv6 !--- address    ipv6 enable
depending on the router advertisements !--- sent by the DHCP client   !
(requesting router). ! ipv6 enable ! end         end
```

验证

请使用本部分描述的命令来验证配置。

> 注意：为了节省空间，本节所示的部分输出已经过换行。

DHCP 服务器上

本节的输出显示了活动客户端数量 (1) 以及其他配置参数信息，例如域名服务器地址和首选存活时间信息。

show ipv6 dhcp pool

```
DHCPv6 pool: dhcpv6
  Prefix pool: dhcpv6-pool1
  preferred lifetime 600, valid lifetime 1800
  DNS server: 2001:DB8:3000:3000::42
  Domain name: example.com
  Active clients: 1
```

show ipv6 dhcp binding命令提供有关客户端的信息，包括其DUID、IAPD、前缀以及首选和有效生存期。

show ipv6 dhcp binding

```
Client: FE80::C002:FFF:FEB4:0
  DUID: 00030001C2020FB40000
  Username : unassigned
  Interface : Serial0/0
  IA PD: IA ID 0x00060001, T1 300, T2 480
  Prefix: 2001:DB8:1200::/48
  preferred lifetime 600, valid lifetime 1800
  expires at Mar 02 2002 01:26 AM (1707 seconds)
```

DHCP 客户端上

show ipv6 dhcp interface命令显示接口S0/0已在客户端模式下配置，并显示DNS服务器地址及其从DHCP服务器接收的域名的详细信息。

show ipv6 dhcp interface

```
Serial0/0 is in client mode
  State is OPEN
  Renew will be sent in 00:04:37
  List of known servers:
  Reachable via address: FE80::C003:FFF:FEB4:0
  DUID: 00030001C2030FB40000
  Preference: 0
  Configuration parameters:
  IA PD: IA ID 0x00060001, T1 300, T2 480
  Prefix: 2001:DB8:1200::/48
  preferred lifetime 600, valid lifetime 1800
  expires at Mar 01 2002 10:59 AM (1777 seconds)
  DNS server: 2001:DB8:3000:3000::42
  Domain name: example.com
  Information refresh time: 0
  Prefix name: prefix-from-provider
  Rapid-Commit: disabled
```

快速以太网接口Fa0/0和Fa0/1上的show ipv6 interface命令提供以下输出：

show ipv6 int fa0/0

```
FastEthernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address
        is FE80::C002:FFF:FEB4:0
  No Virtual link-local address(es):
  Global unicast address(es):
    2001:DB8:1200:1::1, subnet is
        2001:DB8:1200:1::/64 [CAL/PRE]
      valid lifetime 1535 preferred lifetime 335
!--- Output omitted.
```

show ipv6 int fa0/1

```
FastEthernet0/1 is up, line protocol is up
  IPv6 is enabled, link-local address
        is FE80::C002:FFF:FEB4:1
  No Virtual link-local address(es):
  Global unicast address(es):
    2001:DB8:1200::1, subnet is
        2001:DB8:1200::/64 [CAL/PRE]
      valid lifetime 1712 preferred lifetime 512
!--- Output omitted.
```

show ipv6 general-prefix命令通过前缀委派验证从DHCP服务器收到的任何前缀（常规前缀）。

show ipv6 general-prefix

```
IPv6 Prefix prefix-from-provider, acquired via DHCP PD
  2001:DB8:1200::/48 Valid lifetime 1656, preferred lifetime 456
!--- 2001:DB8:1200::/48 is the general prefix received from server. FastEthernet0/1 (Address command)
FastEthernet0/0 (Address command)
```

本地 LAN 客户端上

客户端路由器Client 1和Client 2的FastEthernet接口Fa0/0上的show ipv6 interface命令提供以下输出：

show ipv6 int fa0/0
客户端 1

```
FastEthernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address
        is FE80::C000:FFF:FEB4:0
```

客户端 2

```
FastEthernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address
        is FE80::C001:FFF:FEB4:0
```

```
No Virtual link-local address(es):          No Virtual link-local address(es):
Global unicast address(es):                 Global unicast address(es):
2001:DB8:1200:1:C000:FFF:FEB4:0, subnet is  2001:DB8:1200:0:C001:FFF:FEB4:0, subnet
        2001:DB8:1200:1::/64 [EUI/CAL/PRE]          is 2001:DB8:1200::/64 [EUI/CAL/PRE]
valid lifetime 1709 preferred lifetime 509  valid lifetime 1770 preferred lifetime 570
```

故障排除

目前没有针对此配置的故障排除信息。

相关信息

- [IPv6 技术支持](#)
- [在 Cisco IOS 中配置 DHCPv6](#)
- [技术支持和文档 - Cisco Systems](#)