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## Introduction

This document describes Prefix Delegation configuration example in scenarios where Layer 2 Tunneling Protocol Network Server (LNS) delegates an IPv6 prefix to the Client router over Virtual Private Dialup Network (VPDN) Tunnel built between the Layer 2 Tunneling Protocol Access Concentrator (LAC) and LNS.

## Prerequisites

### Requirements

Cisco recommends that you have knowledge of End-to-End Layer 1 connectivity that is UP

### Components Used

This document is not restricted to specific software and hardware versions.

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

## Configure

**Note:** Use the [Command Lookup Tool](#) ([registered](#) customers only) in order to obtain more information on the commands used in this section.

## Network Diagram

This document uses this network setup:



## Configurations

### Client Configuration:

An example of the configuration on the Client router is shown here:

### LAC Configuration:

An example of the configuration on the LAC is shown here:

### LNS Configuration:

An example of the configuration on the LNS is shown here:

```
!  
vpdn enable  
!  
vpdn-group 1  
accept-dialin  
protocol l2tp  
virtual-template 1  
terminate-from hostname LAC  
vpn vrf test  
lcp renegotiation on-mismatch  
no l2tp tunnel authentication  
!  
username test@cisco.com password cisco  
interface Ethernet1/0  
 ip vrf forwarding test  
 ip address 192.168.1.2 255.255.255.0  
 negotiation auto  
 cdp enable  
end interface Virtual-Template1 ip address 10.1.1.1 255.255.255.0 ipv6 enable  
 ipv6 dhcp server AAA  
 peer default ip address pool local  
 peer default ipv6 pool PPPOE_POOL6  
 no keepalive  
 ppp authentication chap ! ipv6 dhcp pool AAA  
 prefix-delegation pool DHCPv6Pool  
!  
ipv6 local pool PPPOE_POOL6 2001:DB8:5AB:10::/60 64  
!  
ip local pool local 10.1.1.2 10.1.1.100  
!  
ipv6 local pool DHCPv6Pool 2A02:838F:F880::/42 56  
!
```

## Verify

```
Client#show ipv6 interface brief FastEthernet0/2  
FastEthernet0/2 [up/up]  
 FE80::205:FF:FE77:2C1B  
 2A02:838F:F880::1
```

```
Client#show ipv6 interface brief dialer1  
Dialer1 [up/up]  
 FE80::1234  
 2001:DB8:5AB:10::1234
```

## Troubleshoot on Client

```
Client#show ipv6 interface brief FastEthernet0/2  
FastEthernet0/2 [up/up]
```

```
FE80::205:FF:FE77:2C1B
2A02:838F:F880::1
```

```
Client#show ipv6 interface brief dialer1
Dialer1 [up/up]
FE80::1234
2001:DB8:5AB:10::1234
```

```
Client#show ipv6 interface brief FastEthernet0/2
FastEthernet0/2 [up/up]
FE80::205:FF:FE77:2C1B
2A02:838F:F880::1
```

```
Client#show ipv6 interface brief dialer1
Dialer1 [up/up]
FE80::1234
2001:DB8:5AB:10::1234
```

This a snippet of debug ipv6 dhcp detail on the Client router after PPP Negotiation has been completed and respective Virtual-Access is UP.

```
*Jun 27 15:08:53.019: %LINEPROTO-5-UPDOWN: Line protocol on Interface Virtual-Access2, changed state to up
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: detailed packet contents
```

```
*Jun 27 15:09:03.711: src FE80::1234
```

```
*Jun 27 15:09:03.711: dst FF02::1:2 (Dialer1)
```

```
*Jun 27 15:09:03.711: type REQUEST(3), xid 1849347
```

```
*Jun 27 15:09:03.711: option ELAPSED-TIME(8), len 2
```

```
*Jun 27 15:09:03.711: elapsed-time 3202
```

```
*Jun 27 15:09:03.711: option CLIENTID(1), len 10
```

```
*Jun 27 15:09:03.711: 00030001000500772C1B
```

```
*Jun 27 15:09:03.711: option ORO(6), len 6
```

```
*Jun 27 15:09:03.711: IA-PD,DNS-SERVERS,DOMAIN-LIST
```

```
*Jun 27 15:09:03.711: option SERVERID(2), len 10
```

```
*Jun 27 15:09:03.711: 000300017CAD74F9EB00
```

```
*Jun 27 15:09:03.711: option IA-PD(25), len 41
```

```
*Jun 27 15:09:03.711: IAID 0x000B0001, T1 0, T2 0
```

```
*Jun 27 15:09:03.711: option IAPREFIX(26), len 25
```

```
*Jun 27 15:09:03.711: preferred 0, valid 0, prefix 2A02:838F:F880::/56
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: Sending REQUEST to FF02::1:2 on Dialer1
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: Received REPLY from FE80::7EAD:74FF:FEF9:EB00 on Dialer1
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: detailed packet contents
```

```
*Jun 27 15:09:03.711: src FE80::7EAD:74FF:FEF9:EB00 (Dialer1)
```

```
*Jun 27 15:09:03.711: dst FE80::1234 (Dialer1)
```

```
*Jun 27 15:09:03.711: type REPLY(7), xid 1849347
```

```
*Jun 27 15:09:03.711: option SERVERID(2), len 10
```

```
*Jun 27 15:09:03.711: 000300017CAD74F9EB00
```

```
*Jun 27 15:09:03.711: option CLIENTID(1), len 10
```

```
*Jun 27 15:09:03.711: 00030001000500772C1B
```

```
*Jun 27 15:09:03.711: option IA-PD(25), len 41
```

```
*Jun 27 15:09:03.711: IAID 0x000B0001, T1 302400, T2 483840
```

```
*Jun 27 15:09:03.711: option IAPREFIX(26), len 25
```

```
*Jun 27 15:09:03.711: preferred 604800, valid 2592000, prefix 2A02:838F:F880::/56
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: Processing options
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: Adding prefix 2A02:838F:F880::/56 to my-prefix1
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: T1 set to expire in 302400 seconds
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: T2 set to expire in 483840 seconds
```

```
*Jun 27 15:09:03.711: IPv6 DHCP: DHCPv6 changes state from REQUEST to OPEN (REPLY_RECEIVED) on Dialer1
```

## Related Information

- [IPv6 Access Service: DHCPv6 Prefix Delegation](#)

- [Technical Support & Documentation - Cisco Systems](#)