

# ASA: Ejemplo y troubleshooting de la configuración de Relay DHCPv6

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## Introducción

El documento describe cómo configurar un dispositivo de seguridad adaptante de Cisco (ASA) como un Agente Relay DHCPv6 y también cubre algún Troubleshooting básico. En la versión del código 9.0 ASA y posterior, los soportes ASA

## Prerrequisitos

### Requisitos

Cisco recomienda que tenga conocimiento sobre estos temas:

- Conceptos básicos del IPv6
- IPv6 que dirige el mecanismo
- Flujo de paquetes DHCPv6
- Conceptos del relé DHCP

## Componentes Utilizados

La información en este documento se basa en la versión 9.1.2 ASA 5500.

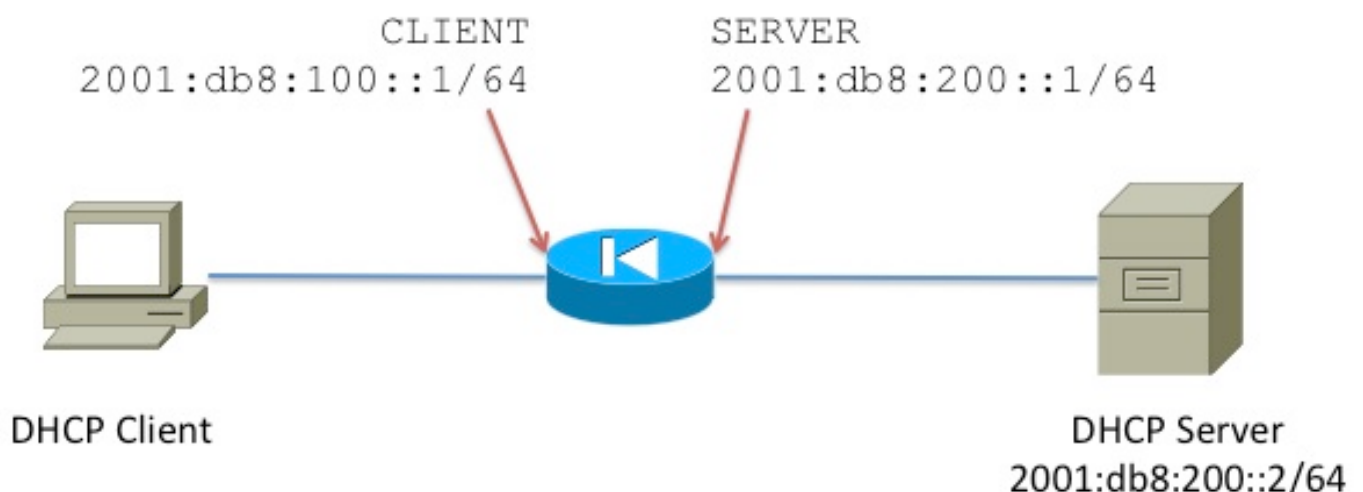
La información que contiene este documento se creó a partir de los dispositivos en un ambiente de laboratorio específico. Todos los dispositivos que se utilizan en este documento se pusieron en funcionamiento con una configuración verificada (predeterminada). Si la red está funcionando, asegúrese de haber comprendido el impacto que puede tener cualquier comando.

## Stateful contra DHCPv6 apátrida

Si usted entiende el método distinto de asignación de dirección en el IPv6, le ayuda a entender cómo la función de relay DHCPv6 trabaja en el ASA. Refre a la [asignación de dirección dinámica en el IPv6 usando SLAAC y DHCP](#) para una introducción a la configuración automática de dirección apátrida (SLAAC) y a DHCPv6.

## Diagrama de la red

Esta configuración de muestra describe cómo configurar el ASA como Agente Relay DHCPv6. En esta configuración, el **CLIENTE** es la interfaz donde el cliente del IPv6 está conectado. El **SERVIDOR** es la interfaz a través de la cual el servidor DHCPv6 **2001:db8:200::2/64** es accesible.



## DHCPv6 contra los Tipos de mensaje DHCPv4

DHCPv6 Message Type	DHCPv4 Message Type
Solicit (1)	DHCPDISCOVER
Advertise (2)	DHCPOFFER
Request (3), Renew (5), Rebind (6)	DHCPREQUEST
Reply (7)	DHCPACK / DHCPNAK
Release (8)	DHCPRELEASE
Information-Request (11)	DHCPINFORM
Decline (9)	DHCPDECLINE
Confirm (4)	none
Reconfigure (10)	DHCPFORCERENEW
Relay-Forw (12), Relay-Reply (13)	none

## Retransmisión apátrida DHCPv6

### Configuración

Aquí está la configuración básica para la configuración de Relay apátrida DHCPv6 en el ASA:

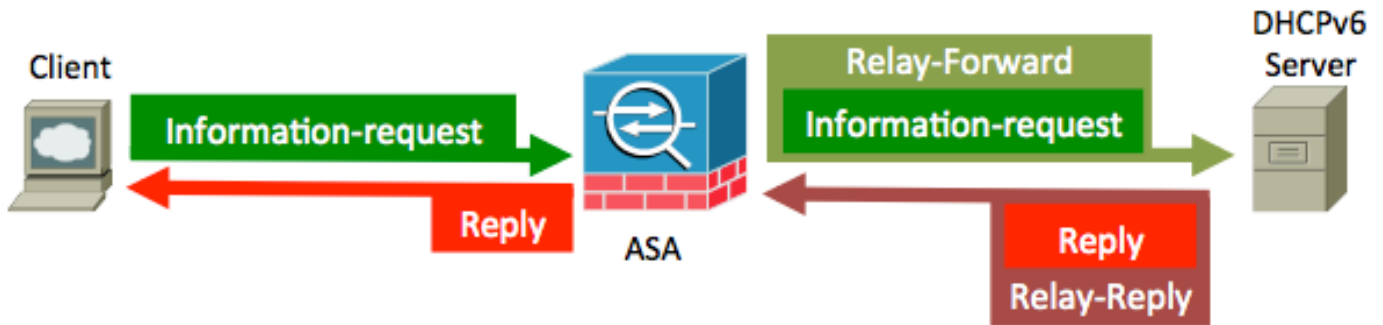
```
interface GigabitEthernet0/1
 nameif CLIENT
 security-level 100
 ipv6 address 2001:db8:100::1/64
 ipv6 enable
 ipv6 nd other-config-flag
!
interface GigabitEthernet0/0
 nameif SERVER
 security-level 0
 ipv6 address 2001:db8:200:1/64
 ipv6 enable
!
ipv6 dhcprelay server 2001:db8:200:2 inside
ipv6 dhcprelay enable outside
```

### Flujo de paquetes

Con DHCPv6 apátrida, aquí está el flujo de paquetes del cliente:



El ASA intercepta estos paquetes y los envuelve en el formato del relé DHCP:



## Verificación

### Depuraciones

Si usted habilita el **IPv6 del debug dhcprelay** y hace el **debug del DHCP del IPv6**, después la salida relevante imprime a la pantalla. Esta salida se toma de un escenario de trabajo:

```
IPv6 DHCP: Received INFORMATION-REQUEST from fe80::c671:feff:fe93:b51a on CLIENT
```

```
IPv6 DHCP: detailed packet contents
src fe80::c671:feff:fe93:b51a (CLIENT)
dst ff02::1:2
type INFORMATION-REQUEST(11), xid 1588088
option ELAPSED-TIME(8), len 2
  elapsed-time 0
option CLIENTID(1), len 10
  00030001c471fe93b516
option ORO(6), len 6
  DNS-SERVERS,DOMAIN-LIST,UNKNOWN
```

```
IPv6 DHCP_RELAY: Relaying INFORMATION-REQUEST from fe80::c671:feff:fe93:b51a on CLIENT
IPv6 DHCP_RELAY: Creating relay binding for fe80::c671:feff:fe93:b51a at interface CLIENT
IPv6 DHCP_RELAY:   to 2001:db8:200::2 via 2001:db8:200::2 using SERVER
IPv6 DHCP: Sending RELAY-FORWARD to 2001:db8:200::2 on SERVER
```

```
IPv6 DHCP: detailed packet contents
src 2001:db8:200::1
dst 2001:db8:200::2 (SERVER)
type RELAY-FORWARD(12), hop 0
link 2001:db8:100::1
peer fe80::c671:feff:fe93:b51a
option RELAY-MSG(9), len 34
type INFORMATION-REQUEST(11), xid 1588088
option ELAPSED-TIME(8), len 2
  elapsed-time 0
option CLIENTID(1), len 10
```

```
    00030001c471fe93b516
option ORO(6), len 6
    DNS-SERVERS,DOMAIN-LIST,UNKNOWN
option INTERFACE-ID(18), len 4
0x00000015
IPv6 DHCP: Received RELAY-REPLY from 2001:db8:200::2 on SERVER
```

IPv6 DHCP: detailed packet contents

```
src 2001:db8:200::2 (SERVER)
dst 2001:db8:200::1
type RELAY-REPLY(13), hop 0
link 2001:db8:100::1
peer fe80::c671:feff:fe93:b51a
option RELAY-MSG(9), len 67
type REPLY(7), xid 1588088
option SERVERID(2), len 10
    00030001002414a33c94
option CLIENTID(1), len 10
    00030001c471fe93b516
option DNS-SERVERS(23), len 16
    2001:db8:1000::1
option DOMAIN-LIST(24), len 11
    cisco.com
option INTERFACE-ID(18), len 4
0x00000015
```

IPv6 DHCP\_RELAY: Relaying RELAY-REPLY from 2001:db8:200::2 on SERVER

IPv6 DHCP\_RELAY: relayed msg: REPLY

IPv6 DHCP\_RELAY: to fe80::c671:feff:fe93:b51a

IPv6 DHCP: Sending REPLY to fe80::c671:feff:fe93:b51a on CLIENT

IPv6 DHCP: detailed packet contents

```
src fe80::219:7ff:fe24:2e44
dst fe80::c671:feff:fe93:b51a (CLIENT)
type REPLY(7), xid 1588088
option SERVERID(2), len 10
    00030001002414a33c94
option CLIENTID(1), len 10
    00030001c471fe93b516
option DNS-SERVERS(23), len 16
    2001:db8:1000::1
option DOMAIN-LIST(24), len 11
    cisco.com
```

En el paquete de pedidos INFORMATION-REQUEST, el cliente pide solamente el DNS-servidor y el dominio, se espera que puesto que el cliente se configura para DHCPv6 apátrida.

## Fotos de Wireshark

### Pedido de DHCP cliente

No.	Time	Source	Destination	Protocol	Length	Identification	Info
1	0.000000	fe80::c671:feff:fe93:b51a	ff02::1:2	DHCPv6	100		Information-request XID: 0xfc3adf CID: 00030001c471fe93b516
2	0.005584	fe80::219:7ff:fe24:2e44	fe80::c671:feff:fe93:b51a	DHCPv6	133		Reply XID: 0xfc3adf CID: 00030001c471fe93b516

Payload length: 42  
Next header: UDP (17)  
Hop limit: 255

Source: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a) → Src. Address field set to link-local IPv6 address assigned to the sending interface.  
[Source SA MAC: c4:71:fe:93:b5:1a (c4:71:fe:93:b5:1a)]  
Destination: ff02::1:2 (ff02::1:2) → Dst. Address set to link-local scope all-routers Multicast address (FF02::2).  
[Source GeoIP: Unknown]  
[Destination GeoIP: Unknown]

User Datagram Protocol, [Src Port: dhcpv6-client (546), Dst Port: dhcpv6-server (547)] UDP ports used for DHCPv6.

DHCPv6

Message type: Information-request (11)  
Transaction ID: 0xfc3adf

Elapsed time  
Option: Elapsed time (8)  
Length: 2  
Value: 0000  
Elapsed-time: 0 ms

Client Identifier  
Option: Client Identifier (1)  
Length: 10  
Value: 00030001c471fe93b516  
DUID: 00030001c471fe93b516  
DUID Type: link-layer address (3)  
Hardware type: Ethernet (1)  
Link-layer address: c4:71:fe:93:b5:16

Option Request  
Option: Option Request (6)  
Length: 6  
Value: 001700180020

Requested option code: DNS recursive name server (23)  
Requested option code: Domain Search List (24)  
Requested option code: Lifetime (32)

Requested options.

## Pedido de DHCP retransmitido por el ASA

No.	Time	Source	Destination	Protocol	Length	Identification	Info
1	0.000000	2001:db8:200::1	2001:db8:200::2	DHCPv6	146		Relay-Forward L: 2001:db8:100::1 Information-request XID: 0xfc3adf CID: 00030001c471fe93b516
2	0.004836	2001:db8:200::2	2001:db8:200::1	DHCPv6	179		Relay-reply L: 2001:db8:100::1 Reply XID: 0xfc3adf CID: 00030001c471fe93b516

User Datagram Protocol, [Src Port: dhcpv6-server (547), Dst Port: dhcpv6-server (547)] Ports used for DHCPv6 Relay

DHCPv6

Message type: Relay-forward (12)  
Hopcount: 0  
Link address: 2001:db8:100::1 (2001:db8:100::1)  
Peer address: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a)

Relay Message  
Option: Relay Message (9)  
Length: 34  
Value: 0bf3c3adf008000200000001000a00030001c471fe93b516...

DHCPv6

Message type: Information-request (11)  
Transaction ID: 0xfc3adf

Elapsed time  
Option: Elapsed time (8)  
Length: 2  
Value: 0000  
Elapsed-time: 0 ms

Client Identifier  
Option: Client Identifier (1)  
Length: 10  
Value: 00030001c471fe93b516  
DUID: 00030001c471fe93b516  
DUID Type: link-layer address (3)  
Hardware type: Ethernet (1)  
Link-layer address: c4:71:fe:93:b5:16

Option Request  
Option: Option Request (6)  
Length: 6  
Value: 001700180020  
Requested option code: DNS recursive name server (23)  
Requested option code: Domain Search List (24)

## Respuesta DHCP del servidor

No.	Time	Source	Destination	Protocol	Length	Identification	Info
1	0.000000	2001:db8:200::1	2001:db8:200::2	DHCPv6	146		Relay-Forw L: 2001:db8:100::1 Information-request XID: 0xfc3adf CID: 00030001
2	0.004836	2001:db8:200::2	2001:db8:200::1	DHCPv6	179		Relay-reply L: 2001:db8:100::1 Reply XID: 0xfc3adf CID: 00030001c471fe93b516

**DHCPv6**  
 Message type: Relay-reply (13)  
 Hopcount: 0  
 Link address: 2001:db8:100::1 (2001:db8:100::1)  
 Peer address: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a)

**Relay Message**  
 Option: Relay Message (9)  
 Length: 67  
 Value: 07fc3adf0002000a00030001002414a33c940001000a0003...

**DHCPv6**  
 Message type: Reply (7)  
 Transaction ID: 0xfc3adf

**Server Identifier**  
 Option: Server Identifier (2)  
 Length: 10  
 Value: 00030001002414a33c94  
 DUID: 00030001002414a33c94  
 DUID Type: link-layer address (3)  
 Hardware type: Ethernet (1)  
 Link-layer address: 00:24:14:a3:3c:94

**Client Identifier**  
**DNS recursive name server**  
 Option: DNS recursive name server (23)  
 Length: 16  
 Value: 20010db8100000000000000000000001  
 DNS server address: 2001:db8:1000::1 (2001:db8:1000::1) **DNS Server Provided by DHCPv6 Server**

**Domain Search List**  
 Option: Domain Search List (24)  
 Length: 11  
 Value: 05636973636f03636f6d00  
 DNS Domain Search List  
 Domain: cisco.com **Domain name**

## Contestación remitida al cliente

No.	Time	Source	Destination	Protocol	Length	Identification	Info
1	0.000000	fe80::c671:feff:fe93:b51a	ff02::1:2	DHCPv6	100		Information-request XID: 0xfc3adf CID: 00030001c471fe93b516
2	0.005584	fe80::219:7ff:fe24:2e44	fe80::c671:feff:fe93:b51a	DHCPv6	133		Reply XID: 0xfc3adf CID: 00030001c471fe93b516

**Internet Protocol Version 6, Src: fe80::219:7ff:fe24:2e44 (fe80::219:7ff:fe24:2e44), Dst: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a)**  
**User Datagram Protocol, Src Port: dhcpv6-server (547), Dst Port: dhcpv6-client (546)** **Ports used to reply clients**

**DHCPv6**  
 Message type: Reply (7)  
 Transaction ID: 0xfc3adf

**Server Identifier**  
 Option: Server Identifier (2)  
 Length: 10  
 Value: 00030001002414a33c94  
 DUID: 00030001002414a33c94  
 DUID Type: link-layer address (3)  
 Hardware type: Ethernet (1)  
 Link-layer address: 00:24:14:a3:3c:94

**Client Identifier**  
 Option: Client Identifier (1)  
 Length: 10  
 Value: 00030001c471fe93b516  
 DUID: 00030001c471fe93b516  
 DUID Type: link-layer address (3)  
 Hardware type: Ethernet (1)  
 Link-layer address: c4:71:fe:93:b5:16

**DNS recursive name server**  
 Option: DNS recursive name server (23)  
 Length: 16  
 Value: 20010db8100000000000000000000001  
 DNS server address: 2001:db8:1000::1 (2001:db8:1000::1) **Information forwarded to client**

**Domain Search List**  
 Option: Domain Search List (24)  
 Length: 11  
 Value: 05636973636f03636f6d00  
 DNS Domain Search List  
 Domain: cisco.com

## DHCPv6 stateful

### Configuración

Aquí está la configuración básica para la configuración de Relay stateful DHCPv6 en el ASA:

```

interface GigabitEthernet0/1
  nameif CLIENT
  security-level 100
  ipv6 address 2001:db8:100::1/64
  ipv6 enable
!
interface GigabitEthernet0/0
  nameif SERVER
  security-level 0
  ipv6 address 2001:db8:200:1/64
  ipv6 enable
!
  
```

```

ipv6 dhcprelay server 2001:db8:200:2 inside
ipv6 dhcprelay enable outside

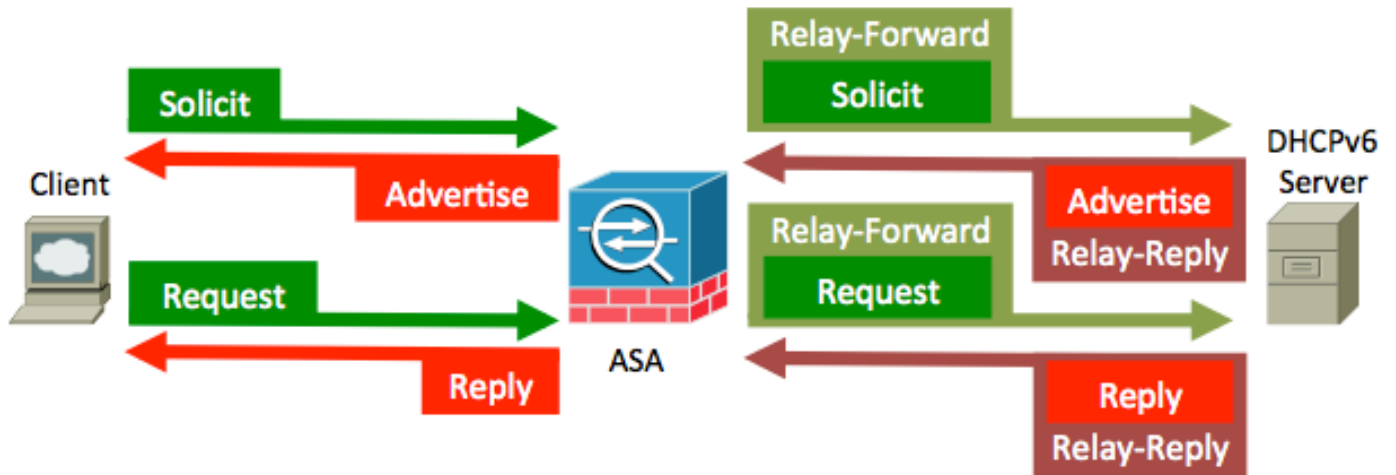
```

## Flujo de paquetes

Con DHCPv6 stateful, aquí está el flujo de paquetes del cliente:



El ASA intercepta estos paquetes y los envuelve en el formato del relé DHCP:



## Verificación

### Depuraciones

```
IPv6 DHCP: Received SOLICIT from fe80::c671:feff:fe93:b51a on CLIENT
```

```

IPv6 DHCP: detailed packet contents
src fe80::c671:feff:fe93:b51a (CLIENT)
dst ff02::1:2
type SOLICIT(1), xid 2490681
option ELAPSED-TIME(8), len 2
elapsed-time 0
option CLIENTID(1), len 10
00030001c471fe93b516
option ORO(6), len 4
DNS-SERVERS,DOMAIN-LIST
option IA-NA(3), len 12
IAID 0x00040001, T1 0, T2 0

```

```
IPv6 DHCP_RELAY: Relaying SOLICIT from fe80::c671:feff:fe93:b51a on CLIENT
```

```
IPv6 DHCP_RELAY: Creating relay binding for fe80::c671:feff:fe93:b51a at interface CLIENT
```

```
IPv6 DHCP_RELAY: to 2001:db8:200::2 via 2001:db8:200::2 using SERVER
```



IPv6 DHCP: Sending RELAY-FORWARD to 2001:db8:200::2 on SERVER

IPv6 DHCP: detailed packet contents

```
src 2001:db8:200::1
dst 2001:db8:200::2 (SERVER)
type RELAY-FORWARD(12), hop 0
link 2001:db8:100::1
peer fe80::c671:feff:fe93:b51a
option RELAY-MSG(9), len 48
type SOLICIT(1), xid 2490681
option ELAPSED-TIME(8), len 2
  elapsed-time 0
option CLIENTID(1), len 10
  00030001c471fe93b516
option ORO(6), len 4
  DNS-SERVERS,DOMAIN-LIST
option IA-NA(3), len 12
  IAID 0x00040001, T1 0, T2 0
option INTERFACE-ID(18), len 4
  0x00000015
```

IPv6 DHCP: Received RELAY-REPLY from 2001:db8:200::2 on SERVER

IPv6 DHCP: detailed packet contents

```
src 2001:db8:200::2 (SERVER)
dst 2001:db8:200::1
type RELAY-REPLY(13), hop 0
link 2001:db8:100::1
peer fe80::c671:feff:fe93:b51a
option RELAY-MSG(9), len 111
type ADVERTISE(2), xid 2490681
option SERVERID(2), len 10
  00030001002414a33c94
option CLIENTID(1), len 10
  00030001c471fe93b516
option IA-NA(3), len 40
  IAID 0x00040001, T1 43200, T2 69120
option IAADDR(5), len 24
  IPv6 address 2001:db8:300:0:48ae:5f5d:8290:e926
  preferred INFINITY, valid INFINITY
option DNS-SERVERS(23), len 16
  2001:db8:1000::1
option DOMAIN-LIST(24), len 11
  cisco.com
option INTERFACE-ID(18), len 4
  0x00000015
```

IPv6 DHCP\_RELAY: Relaying RELAY-REPLY from 2001:db8:200::2 on SERVER

IPv6 DHCP\_RELAY: relayed msg: ADVERTISE

IPv6 DHCP\_RELAY: to fe80::c671:feff:fe93:b51a

IPv6 DHCP: Sending ADVERTISE to fe80::c671:feff:fe93:b51a on CLIENT

IPv6 DHCP: detailed packet contents

```
src fe80::219:7ff:fe24:2e44
dst fe80::c671:feff:fe93:b51a (CLIENT)
type ADVERTISE(2), xid 2490681
option SERVERID(2), len 10
  00030001002414a33c94
option CLIENTID(1), len 10
  00030001c471fe93b516
option IA-NA(3), len 40
  IAID 0x00040001, T1 43200, T2 69120
option IAADDR(5), len 24
  IPv6 address 2001:db8:300:0:48ae:5f5d:8290:e926
  preferred INFINITY, valid INFINITY
option DNS-SERVERS(23), len 16
```

2001:db8:1000::1  
option DOMAIN-LIST(24), len 11  
cisco.com

IPv6 DHCP: Received REQUEST from fe80::c671:feff:fe93:b51a on CLIENT

IPv6 DHCP: detailed packet contents

src fe80::c671:feff:fe93:b51a (CLIENT)  
dst ff02::1:2  
type REQUEST(3), xid 2492842  
option ELAPSED-TIME(8), len 2  
elapsed-time 0  
option CLIENTID(1), len 10  
00030001c471fe93b516  
option ORO(6), len 4  
DNS-SERVERS,DOMAIN-LIST  
option SERVERID(2), len 10  
00030001002414a33c94  
option IA-NA(3), len 40  
IAID 0x00040001, T1 0, T2 0  
option IAADDR(5), len 24  
IPv6 address 2001:db8:300:0:48ae:5f5d:8290:e926  
preferred INFINITY, valid INFINITY

IPv6 DHCP\_RELAY: Relaying REQUEST from fe80::c671:feff:fe93:b51a on CLIENT

IPv6 DHCP\_RELAY: to 2001:db8:200::2 via 2001:db8:200::2 using SERVER

IPv6 DHCP: Sending RELAY-FORWARD to 2001:db8:200::2 on SERVER

IPv6 DHCP: detailed packet contents

src 2001:db8:200::1  
dst 2001:db8:200::2 (SERVER)  
type RELAY-FORWARD(12), hop 0  
link 2001:db8:100::1  
peer fe80::c671:feff:fe93:b51a  
option RELAY-MSG(9), len 90  
type REQUEST(3), xid 2492842  
option ELAPSED-TIME(8), len 2  
elapsed-time 0  
option CLIENTID(1), len 10  
00030001c471fe93b516  
option ORO(6), len 4  
DNS-SERVERS,DOMAIN-LIST  
option SERVERID(2), len 10  
00030001002414a33c94  
option IA-NA(3), len 40  
IAID 0x00040001, T1 0, T2 0  
option IAADDR(5), len 24  
IPv6 address 2001:db8:300:0:48ae:5f5d:8290:e926  
preferred INFINITY, valid INFINITY  
option INTERFACE-ID(18), len 4  
0x00000015

IPv6 DHCP: Received RELAY-REPLY from 2001:db8:200::2 on SERVER

IPv6 DHCP: detailed packet contents

src 2001:db8:200::2 (SERVER)  
dst 2001:db8:200::1  
type RELAY-REPLY(13), hop 0  
link 2001:db8:100::1  
peer fe80::c671:feff:fe93:b51a  
option RELAY-MSG(9), len 111  
type REPLY(7), xid 2492842  
option SERVERID(2), len 10  
00030001002414a33c94  
option CLIENTID(1), len 10  
00030001c471fe93b516  
option IA-NA(3), len 40

```

IAID 0x00040001, T1 43200, T2 69120
option IAADDR(5), len 24
  IPv6 address 2001:db8:300:0:48ae:5f5d:8290:e926
  preferred INFINITY, valid INFINITY
option DNS-SERVERS(23), len 16
  2001:db8:1000::1
option DOMAIN-LIST(24), len 11
  cisco.com
option INTERFACE-ID(18), len 4
  0x00000015

```

IPv6 DHCP\_RELAY: Relaying RELAY-REPLY from 2001:db8:200::2 on SERVER

IPv6 DHCP\_RELAY: relayed msg: REPLY

IPv6 DHCP\_RELAY: to fe80::c671:feff:fe93:b51a

IPv6 DHCP: Sending REPLY to fe80::c671:feff:fe93:b51a on CLIENT

IPv6 DHCP: detailed packet contents

```

src fe80::219:7ff:fe24:2e44
dst fe80::c671:feff:fe93:b51a (CLIENT)
type REPLY(7), xid 2492842
option SERVERID(2), len 10
00030001002414a33c94
option CLIENTID(1), len 10
00030001c471fe93b516
option IA-NA(3), len 40
IAID 0x00040001, T1 43200, T2 69120
option IAADDR(5), len 24
  IPv6 address 2001:db8:300:0:48ae:5f5d:8290:e926
  preferred INFINITY, valid INFINITY
option DNS-SERVERS(23), len 16
  2001:db8:1000::1
option DOMAIN-LIST(24), len 11
  cisco.com

```

## Fotos de Wireshark

### SOLICITE (1)

Un cliente DHCPv6 envía un mensaje de la solicitud para localizar los servidores DHCPv6.

The image shows a Wireshark packet capture of a DHCPv6 SOLICIT message. The packet list shows three frames: a Solicit message from fe80::c671:feff:fe93:b51a to ff02::1:2, an Advertise message from fe80::219:7ff:fe24:2e44 to fe80::c671:feff:fe93:b51a, and a Reply message from fe80::219:7ff:fe24:2e44 to fe80::c671:feff:fe93:b51a.

The packet details for the first frame (Solicit) are as follows:

- Internet Protocol Version 6, Src: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a), Dst: ff02::1:2 (ff02::1:2)
- User Datagram Protocol, Src Port: dhcpv6-client (546), Dst Port: dhcpv6-server (547) **Ports used between clients and Relay Agent (ASA).**
- DHCPv6
  - Message type: solicit (1) **DHCPv6 client sends a solicit message.**
  - Transaction ID: 0x260139
  - Elapsed time
    - Option: Elapsed time (8)
    - Length: 2
    - Value: 0000
    - Elapsed-time: 0 ms
  - Client Identifier
    - Option: Client Identifier (1)
    - Length: 10
    - Value: 00030001c471fe93b516
    - DUID: 00030001c471fe93b516 **Each DHCP client and server has a DUID. DHCP servers use DUIDs to identify clients for the selection of configuration parameters and in the association of IAs with clients.**
    - DUID Type: link-layer address (3)
    - Hardware type: Ethernet (1)
    - Link-layer address: c4:71:fe:93:b5:16
  - Option Request
    - Option: Option Request (6)
    - Length: 4
    - Value: 00170018
    - Requested option code: DNS recursive name server (23)
    - Requested option code: Domain search List (24)
  - Identity Association for Non-temporary Address
    - Option: Identity Association for Non-temporary Address (3)
    - Length: 12
    - Value: 00040001000000000000000000
    - IAID: 00040001
    - T1: 0
    - T2: 0

**The client is responsible for creating IAs and requesting that a server assign IPv6 address to IA.**

El ASA retransmite el mensaje de la solicitud.

Source	Destination	Protocol	Length	Identification	Info
2001:db8:200::1	2001:db8:200::2	DHCPv6	160		Relay-Forw L: 2001:db8:100::1 Solicit XID: 0x260139 CID: 00030001c471fe93b
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Advertise XID: 0x260139 CID: 00030001c471fe93b
2001:db8:200::1	2001:db8:200::2	DHCPv6	202		Relay-Forw L: 2001:db8:100::1 Request XID: 0x2609aa CID: 00030001c471fe93b
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Reply XID: 0x2609aa CID: 00030001c471fe93b5

Frame 1: 160 bytes on wire (1280 bits), 160 bytes captured (1280 bits)

Ethernet II, Src: Cisco\_24:2e:44 (00:19:07:24:2e:44), Dst: Cisco\_a3:3c:98 (00:24:14:a3:3c:98)

802.1Q Virtual LAN, PRI: 0, CFI: 0, ID: 901

Internet Protocol Version 6, Src: 2001:db8:200::1 (2001:db8:200::1), Dst: 2001:db8:200::2 (2001:db8:200::2)

User Datagram Protocol, Src Port: dhcpv6-server (547), Dst Port: dhcpv6-server (547) **Ports used between ASA and DHCPv6 server.**

DHCPv6

Message type: Relay-forw (12) **ASA relay's Solicit message**

Hopcount: 0

Link address: 2001:db8:100::1 (2001:db8:100::1)

Peer address: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a)

Relay Message

Option: Relay Message (9)

Length: 48

Value: 012601390008000200000001000a00030001c471fe93b516...

DHCPv6

Message type: solicit (1)

Transaction ID: 0x260139

- Elapsed time
- Client Identifier
- Option Request
- Identity Association for Non-temporary Address

Interface-Id

## HAGA PUBLICIDAD de (2)

Un servidor envía un mensaje de la publicidad para indicar que está disponible para el servicio del DHCP, y respuesta a un mensaje de la solicitud recibido de un cliente.

Source	Destination	Protocol	Length	Identification	Info
2001:db8:200::1	2001:db8:200::2	DHCPv6	160		Relay-forw L: 2001:db8:100::1 Solicit XID: 0x260139 CID: 00030001c471fe93b
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Advertise XID: 0x260139 CID: 00030001c471fe93b
2001:db8:200::1	2001:db8:200::2	DHCPv6	202		Relay-Forw L: 2001:db8:100::1 Request XID: 0x2609aa CID: 00030001c471fe93b
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Reply XID: 0x2609aa CID: 00030001c471fe93b5

Frame 2: 223 bytes on wire (1784 bits), 223 bytes captured (1784 bits)

Ethernet II, Src: Cisco\_a3:3c:98 (00:24:14:a3:3c:98), Dst: Cisco\_24:2e:44 (00:19:07:24:2e:44)

802.1Q Virtual LAN, PRI: 6, CFI: 0, ID: 901

Internet Protocol Version 6, Src: 2001:db8:200::2 (2001:db8:200::2), Dst: 2001:db8:200::1 (2001:db8:200::1)

User Datagram Protocol, Src Port: dhcpv6-server (547), Dst Port: dhcpv6-server (547)

DHCPv6

Message type: Relay-reply (13)

Hopcount: 0

Link address: 2001:db8:100::1 (2001:db8:100::1)

Peer address: fe80::c671:feff:fe93:b51a (fe80::c671:feff:fe93:b51a)

Relay Message

Option: Relay Message (9)

Length: 111

Value: 022601390002000a00030001002414a33c940001000a0003...

DHCPv6

Message type: Advertise (2) **Server sends an Advertise message to indicate that it is available for DHCPv6 service.**

Transaction ID: 0x260139

- Server Identifier
- Client Identifier
- Identity Association for Non-temporary Address
- DNS recursive name server
- Domain Search List

Interface-Id

Message type: Advertise (2)

Transaction ID: 0x260139

- Server Identifier
  - Option: Server Identifier (2)
  - Length: 10
  - Value: 00030001002414a33c94
  - Server DUID**
  - DUID: 00030001002414a33c94
  - DUID Type: Link-layer address (3)
  - Hardware type: Ethernet (1)
  - Link-layer address: 00:24:14:a3:3c:94
- Client Identifier
- Identity Association for Non-temporary Address
  - Option: Identity Association for Non-temporary Address (3)
  - Length: 40
  - Value: 000400010000a8c000010e000005001820010db803000000...
  - IAID: 00040001
  - T1: 43200
  - T2: 69120
- IA Address
  - Option: IA Address (5)
  - Length: 24
  - Value: 20010db80300000048ae5f5d8290e926ffffffffffffffff
  - Offered IP Address**
  - IPv6 address: 2001:db8:300:0:48ae:5f5d:8290:e926 (2001:db8:300:0:48ae:5f5d:8290:e926)
  - Preferred lifetime: infinity
  - Preferred lifetime: infinity
- DNS recursive name server
  - Option: DNS recursive name server (23)
  - Length: 16
  - Value: 2001:db8:1000:0:0:0:0:0
  - DNS Server IP Address**
  - DNS server address: 2001:db8:1000::1 (2001:db8:1000::1)
- Domain Search List
  - Option: Domain Search List (24)
  - Length: 11
  - Value: 05636973636f03636fd00
  - Domain Name Provided**
  - DNS Domain Search List
  - Domain: cisco.com

Interface-Id

## PETICIÓN (3)

Un cliente envía un mensaje request para pedir los parámetros de la configuración, que incluyen los IP Addresses o los prefijos delegados, de un servidor específico.

Source	Destination	Protocol	Length	Identification	Info
fe80::c671:feff:fe93:b51a	ff02::1:2	DHCPv6	114		solicit XID: 0x260139 CID: 00030001c471fe93b516
fe80::219:7ff:fe24:2e44	fe80::c671:feff:fe93:b51a	DHCPv6	177		Advertise XID: 0x260139 CID: 00030001c471fe93b516 IAA: 2001:db8:300:0:48ae:5f5d:8290:e926
fe80::c671:feff:fe93:b51a	ff02::1:2	DHCPv6	156		Request XID: 0x2609aa CID: 00030001c471fe93b516 IAA: 2001:db8:300:0:48ae:5f5d:8290:e926

```

User Datagram Protocol, Src Port: dhcpv6-client (546), Dst Port: dhcpv6-server (547)
DHCPv6
  Message type: Request (3)
  Transaction ID: 0x2609aa
  Elapsed time
    Option: Elapsed time (8)
    Length: 2
    Value: 0000
    Elapsed-time: 0 ms
  Client Identifier
  Option Request
    Option: Option Request (6)
    Length: 4
    Value: 00170018
    Requested option code: DNS recursive name server (23)
    Requested option code: Domain Search List (24)
  Server Identifier
  Identity Association for Non-temporary Address
    Option: Identity Association for Non-temporary Address (3)
    Length: 40
    Value: 000400010000000000000000000000005001820010db803000000...
    IAID: 00040001
    T1: 0
    T2: 0
  IA Address
    Option: IA Address (5)
    Length: 24
    Value: 20010db803000000048ae5f5d8290e926ffffffffffffffff
    IPv6 address: 2001:db8:300:0:48ae:5f5d:8290:e926 (2001:db8:300:0:48ae:5f5d:8290:e926)
    Preferred lifetime: infinity
    Preferred lifetime: infinity
  
```

Client request for IPv6 Address, DNS Server, Domain name.

## CONTESTACIÓN (7)

Un servidor envía un mensaje de la contestación que contenga los direccionamientos y los parámetros de la configuración asignados en respuesta a una solicitud, solicitud, renueva, o reencuaderna el mensaje recibido de un cliente. Un servidor envía un mensaje de la contestación que contenga los parámetros de la configuración en respuesta a un mensaje de la Información-petición. Un servidor envía un mensaje de la contestación en respuesta a un mensaje del confirmar que confirme o niega que los direccionamientos asignados al cliente son apropiados al link con el cual el cliente está conectado. Un servidor envía un mensaje de la contestación para reconocer el recibo de una versión o disminuir el mensaje.

Source	Destination	Protocol	Length	Identification	Info
2001:db8:200::1	2001:db8:200::2	DHCPv6	160		Relay-forw L: 2001:db8:100::1 solicit XID: 0x260139 CID: 00030001c471fe93b516
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Advertise XID: 0x260139 CID: 00030001c471fe93b516
2001:db8:200::1	2001:db8:200::2	DHCPv6	202		Relay-Forw L: 2001:db8:100::1 Request XID: 0x2609aa CID: 00030001c471fe93b516
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Reply XID: 0x2609aa CID: 00030001c471fe93b516

```

DHCPv6
  Message type: Reply (7)
  Transaction ID: 0x2609aa
  Server Identifier
  Client Identifier
  Identity Association for Non-temporary Address
    Option: Identity Association for Non-temporary Address (3)
    Length: 40
    Value: 000400010000a8c000010e000005001820010db803000000...
    IAID: 00040001
    T1: 43200
    T2: 69120
  IA Address
    Option: IA Address (5)
    Length: 24
    Value: 20010db803000000048ae5f5d8290e926ffffffffffffffff
    IPv6 address: 2001:db8:300:0:48ae:5f5d:8290:e926 (2001:db8:300:0:48ae:5f5d:8290:e926)
    Preferred lifetime: infinity
    Preferred lifetime: infinity
  DNS recursive name server
    Option: DNS recursive name server (23)
    Length: 16
    Value: 20010db8100000000000000000000001
    DNS server address: 2001:db8:1000::1 (2001:db8:1000::1)
  Domain Search List
    Option: Domain Search List (24)
    Length: 11
    Value: 05636973636f03636fd00
    DNS Domain Search List
    Domain: cisco.com
  
```

## Troubleshooting

Confirme la Conectividad con el servidor DHCPv6.

```
ciscoasa# show ipv6 neighbor
```

IPv6 Address	Age	Link-layer	Addr	State	Interface
2001:db8:200::2	0	0024.14a3.3c98	REACH	SERVER	

Confirme que usted recibe los paquetes del cliente cuando pide un direccionamiento del IPv6. El paquete enviado por el cliente dependerá de las configuraciones de la asignación de dirección (es decir, stateful contra apátrida).

Cuando el cliente comienza el proceso DHCPv6, envía a un router solicita el mensaje para descubrir la presencia de Routers del IPv6 en el link. Envía un mensaje de la solicitud del router de multidifusión para indicar al Routers del IPv6 que responda. En el encabezado Ethernet del Mensaje de solicitud de router, visualización de estos campos:

- El campo de dirección de origen es la dirección MAC del host que pide el direccionamiento del IPv6.
- El campo dirección de destino se fija a 33-33-00-00-00-02.

En la encabezado del IPv6 del Mensaje de solicitud de router, visualización de estos campos.

- El campo de dirección de origen se fija a un direccionamiento del IPv6 del local de la conexión asignado a la interfaz de envío o al IPv6 direccionamiento sin especificar (::).
- El campo dirección de destino se fija a la dirección Multicast del todo-Routers del alcance del local de la conexión (FF02::2).
- El campo del límite del salto se fija a 255.

En la respuesta, el Routers del IPv6 envía los mensajes no solicitados del aviso del router que el mensaje del aviso del router contiene la información requerida por los host para determinar los prefijos del link, la Unidad máxima de transmisión (MTU) del link (MTU), y el específico rutea.

```
ciscoasa(config)# show capture capin detail
```

```
fe80::c671:feff:fe93:b51a.546 > ff02::1:2.547: [udp sum ok] udp 42  
[hlim 255] (len 100)---->Request from client
```

```
fe80::219:7ff:fe24:2e44.547 > fe80::c671:feff:fe93:b51a.546: [udp sum ok]  
udp 75 [class 0xe0] (len 133, hlim 255)
```

```
ciscoasa(config)# show capture capout detail  
2 packets captured
```

```
1: 12:06:52.700799      2001:db8:200:1.547 > 2001:db8:200:2.547:  udp 88  
[class 0xe0]---->ASA forwards request to DHCPv6 router
```

```
2: 12:06:53.289047      2001:db8:200:2.547 > 2001:db8:200:1.547:  udp 121  
[class 0xe0]----> Reply from DHCPV6 server.
```

## Salidas del relé DHCP

```
ciscoasa# show ipv6 dhcprelay binding  
1 in use, 1 most used
```

```
Client: fe80::c671:feff:fe93:b51a (CLIENT)  
DUID: 00030001c471fe93b516, Timeout in 56 seconds
```

**Nota:** El atascamiento es borrado por el ASA después de un período breve. Esto se ve en el **IPv6 del debug dhcprelay.**

```
ciscoasa# show ipv6 dhcprelay binding  
1 in use, 1 most used
```

```
Client: fe80::c671:feff:fe93:b51a (CLIENT)
```

DUID: 00030001c471fe93b516, Timeout in 56 seconds  
ciscoasa# show ipv6 dhcprelay statistics

```
Relay Messages:
SOLICIT                2
ADVERTISE              2
REQUEST                2
CONFIRM                0
RENEW                  0
REBIND                 0
REPLY                  9
RELEASE                1
DECLINE                0
RECONFIGURE            0
INFORMATION-REQUEST    6
RELAY-FORWARD          11
RELAY-REPLY            11

Relay Errors:
Malformed message:    0
Block allocation/duplication failure: 0
Hop count limit exceeded: 0
Forward binding creation failure: 0
Reply binding lookup failure: 0
No output route:     0
Conflict relay server route: 0
Failed to add server input rule: 0
Unit or context is not active: 0

Total Relay Bindings Created: 8
```

## Direccionamientos de la versión

Los clientes pueden liberar su direccionamiento asignado DHCPv6 después de que los hagan usando él para la red. La siguiente sección muestra la salida de los debugs asociada a la versión del direccionamiento en DHCPv6 stateful.

## Depuraciones

```
ciscoasa# show ipv6 dhcprelay statistics

Relay Messages:
SOLICIT                2
ADVERTISE              2
REQUEST                2
CONFIRM                0
RENEW                  0
REBIND                 0
REPLY                  9
RELEASE                1
DECLINE                0
RECONFIGURE            0
INFORMATION-REQUEST    6
RELAY-FORWARD          11
RELAY-REPLY            11

Relay Errors:
Malformed message:    0
Block allocation/duplication failure: 0
Hop count limit exceeded: 0
Forward binding creation failure: 0
```

Reply binding lookup failure:	0
No output route:	0
Conflict relay server route:	0
Failed to add server input rule:	0
Unit or context is not active:	0
Total Relay Bindings Created:	8

## Información Relacionada

[Comprensión diversas de las opciones DHCP](#)

[Ejemplo de configuración del relé DHCP ASA](#)

[Configure el ASA para pasar el tráfico del IPv6](#)

[Capturas de paquetes ASA con el CLI y el ejemplo de la Configuración de ASDM](#)