

ASA: Exemplo de configuração de retransmissão de DHCPv6 e solução de problemas

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Introduction

O documento descreve como configurar um Cisco Adaptive Security Appliance (ASA) como um agente de retransmissão de DHCPv6 e também aborda alguns problemas básicos. No ASA Code versão 9.0 e posterior, o ASA oferece suporte

Prerequisites

Requirements

A Cisco recomenda que você tenha conhecimento destes tópicos:

- Conceitos básicos do IPv6
- mecanismo de endereçamento IPv6
- Fluxo de pacote DHCPv6
- conceitos de retransmissão de DHCP

Componentes Utilizados

As informações neste documento são baseadas no ASA 5500 versão 9.1.2.

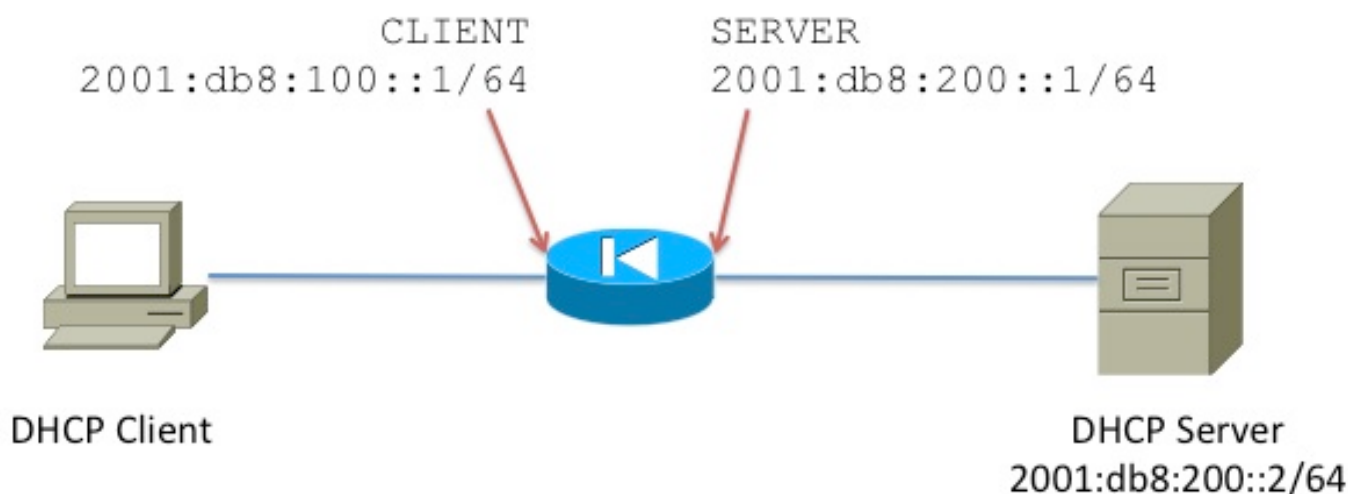
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

DHCPv6 stateful vs Stateless

Se você entender o método diferente de alocação de endereço no IPv6, ele o ajudará a entender como o recurso de retransmissão de DHCPv6 funciona no ASA. Consulte [Atribuição de endereço dinâmico em IPv6 usando SLAAC e DHCP](#) para uma introdução à Configuração automática de endereço stateless (SLAAC) e DHCPv6.

Diagrama de Rede

Esta configuração de exemplo descreve como configurar o ASA como um agente de retransmissão de DHCPv6. Nesta configuração, **CLIENTE** é a interface onde o cliente IPv6 está conectado. **SERVIDOR** é a interface através da qual o servidor DHCPv6 `2001:db8:200::1/64` está acessível.



Tipos de mensagem DHCPv6 vs 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

Retransmissão de DHCPv6 stateless

Configuração

Esta é a configuração básica para a configuração de retransmissão de DHCPv6 stateless no ASA:

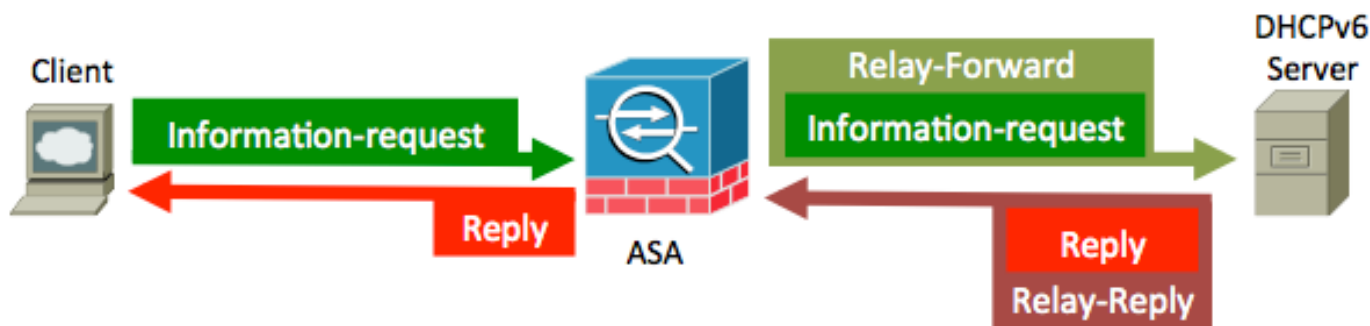
```
interface GigabitEthernet0/1
 nameif CLIENT
 security-level 100
 ipv6 address 2001:db8:100::1/64
 ipv6 enable
 ipv6 nd other-config-flag
!
interface GigabitEthernet0/0
 nameif SERVER
 security-level 0
 ipv6 address 2001:db8:200:1/64
 ipv6 enable
!
ipv6 dhcprelay server 2001:db8:200:2 inside
ipv6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

Fluxo de pacote

Com o DHCPv6 stateless, aqui está o fluxo de pacote do cliente:



O ASA intercepta esses pacotes e os envolve no formato de retransmissão DHCP:



Verificar

Debugs

Se você habilitar **debug ipv6 dhcrelay** e **debug ipv6 dhcp**, a saída relevante será impressa na tela. Esta saída é obtida de um cenário em funcionamento:

```
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
```

No pacote de solicitação INFORMATION-REQUEST, o cliente solicita apenas **DNS-Server** e **Domain**, o que é esperado desde que o cliente está configurado para DHCPv6 stateless.

Instantâneos do Wireshark

Solicitação de cliente DHCP

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)
[Source SA MAC: c4:71:fe:93:b5:1a (c4:71:fe:93:b5:1a)]
Destination: ff02::1:2 (ff02::1:2)
[Source GeoIP: Unknown]
[Destination GeoIP: Unknown]
User Datagram Protocol, Src Port: dhcpv6-client (546), Dst Port: dhcpv6-server (547)
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)
  
```

Src. Address field set to link-local IPv6 address assigned to the sending interface.

Dst. Address set to link-local scope all-routers Multicast address (FF02::2).

UDP ports used for DHCPv6.

Requested options.

Solicitação DHCP transmitida pelo 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: 0bf3c3adf0008000200000001000a00030001c471fe93b516...
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)
  
```

Resposta DHCP do servidor


```

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

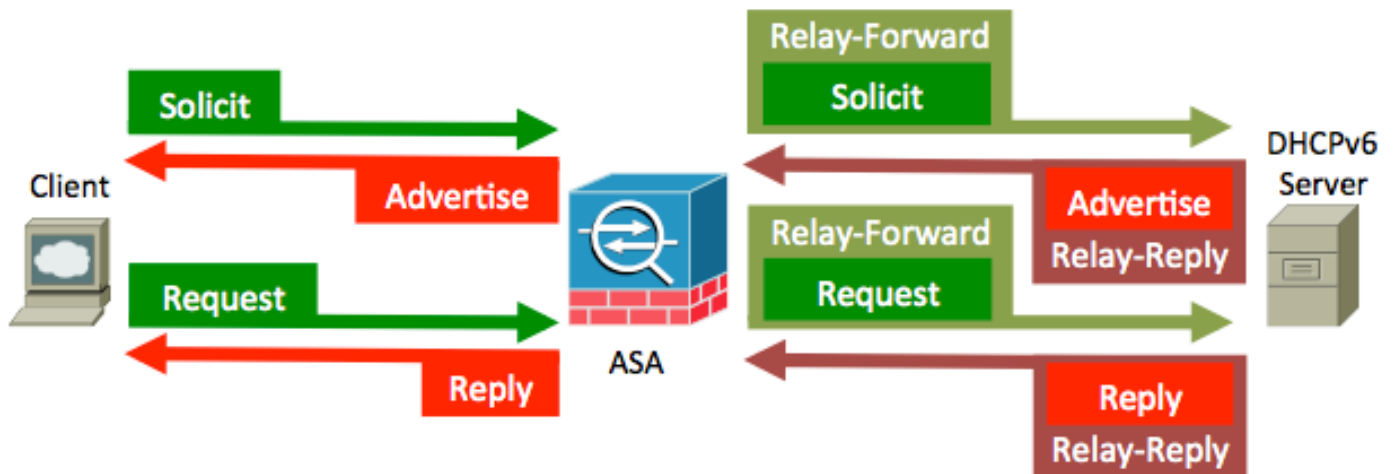
```

Fluxo de pacote

Com o DHCPv6 stateful, aqui está o fluxo de pacotes do cliente:



O ASA intercepta esses pacotes e os envolve no formato de retransmissão DHCP:



Verificar

Debugs

```
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

```

Instantâneos do Wireshark

SOLÍCIO (1)

Um cliente DHCPv6 envia uma mensagem de solicitação para localizar servidores DHCPv6.

The screenshot displays a network traffic capture in Wireshark. The top section shows the packet list with three entries: a SOLICIT message from fe80::c671:feff:fe93:b51a to ff02::1:2, an ADVERTISE message from the same source to fe80::c671:feff:fe93:b51a, and a REPLY message from the same source to fe80::c671:feff:fe93:b51a. The selected packet is a DHCPv6 SOLICIT (1) with transaction ID 0x260139. The details pane shows the following structure:

- Message type: SOLICIT (1)** - DHCPv6 client sends a solicit message.
 - Transaction ID: 0x260139
 - Elapsed time: 0 ms
 - Client Identifier (1):
 - DUID: 00030001c471fe93b516
 - DUID Type: link-layer address (3)
 - Hardware type: Ethernet (1)
 - Link-layer address: c4:71:fe:93:b5:16
 - Option Request (6):
 - Requested option code: DNS recursive name server (23)
 - Requested option code: Domain search List (24)
 - Identity Association for Non-temporary Address (3):
 - The client is responsible for creating IAs and requesting that a server assign IPv6 address to IA.

O ASA retransmite a mensagem de solicitação.

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.

RESPOSTA (7)

Um servidor envia uma mensagem de resposta que contém endereços atribuídos e parâmetros de configuração em resposta a uma mensagem de solicitação, solicitação, renovação ou reassociação recebida de um cliente. Um servidor envia uma mensagem de resposta que contém parâmetros de configuração em resposta a uma mensagem de solicitação de informações. Um servidor envia uma mensagem de resposta em resposta a uma mensagem de confirmação que confirma ou nega que os endereços atribuídos ao cliente são apropriados ao link ao qual o cliente está conectado. Um servidor envia uma mensagem de resposta para confirmar o recebimento de uma mensagem de liberação ou recusa.

Source	Destination	Protocol	Length	Identification	Info
2001:db8:2000::1	2001:db8:2000::2	DHCPv6	160		Relay-forw L: 2001:db8:1000::1 solicit XID: 0x260139 CID: 00030001c471fe93b516
2001:db8:2000::2	2001:db8:2000::1	DHCPv6	223		Relay-reply L: 2001:db8:1000::1 Advertise XID: 0x260139 CID: 00030001c471fe93b516
2001:db8:2000::1	2001:db8:2000::2	DHCPv6	202		Relay-Forw L: 2001:db8:1000::1 Request XID: 0x2609aa CID: 00030001c471fe93b516
2001:db8:2000::2	2001:db8:2000::1	DHCPv6	223		Relay-reply L: 2001:db8:1000::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: 05636973636f03636f6d00
    DNS Domain Search List
    Domain: cisco.com
  
```

Troubleshoot

Confirme a conectividade com o 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 se você recebe pacotes do cliente quando ele solicita um endereço IPv6. O pacote enviado pelo cliente dependerá das configurações de atribuição de endereço (ou seja, stateful vs stateless).

Quando o cliente inicia o processo DHCPv6, ele envia uma mensagem de solicitação de roteador para descobrir a presença de roteadores IPv6 no link. Ele envia uma mensagem de solicitação de roteador multicast para solicitar que os roteadores IPv6 respondam. No cabeçalho Ethernet da mensagem de solicitação do roteador, estes campos são exibidos:

- O campo Endereço de origem é o endereço MAC do host que solicita o endereço IPv6.
- O campo Endereço de destino está definido como 33-33-00-00-00-02.

No cabeçalho IPv6 da mensagem Solicitação do roteador, esses campos são exibidos.

- O campo Endereço de origem é definido como um endereço IPv6 de link local atribuído à interface de envio ou o endereço IPv6 não especificado (::).
- O campo Endereço de destino é definido para o endereço multicast de todos os roteadores de escopo de link local (FF02::2).
- O campo Limite de saltos está definido como 255.

Em Resposta, os roteadores IPv6 enviam mensagens de anúncio de roteador não solicitadas. A mensagem de anúncio de roteador contém as informações exigidas pelos hosts para determinar os prefixos de link, a MTU (Maximum Transmission Unit, Unidade máxima de transmissão) de link e rotas específicas.

```
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.
```

Saídas de retransmissão de 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
```

Note: O enlace é excluído pelo ASA após um curto período. Isso é visto na depuração `ipv6 dhcprelay`.

IPv6 DHCP_RELAY: Deleting binding for fe80::c671:feff:fe93:b51a at interface CLIENT

```
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

Endereços de versão

Os clientes podem liberar o endereço atribuído por DHCPv6 depois de terminarem de usá-lo para a rede. A próxima seção mostra a saída de depuração associada à versão do endereço em DHCPv6 Stateful.

Debugs

IPv6 DHCP: Received RELEASE 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 RELEASE(8), xid 3180815
option ELAPSED-TIME(8), len 2
elapsed-time 0
option CLIENTID(1), len 10
00030001c471fe93b516
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 RELEASE 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 82
type RELEASE(8), xid 3180815
option ELAPSED-TIME(8), len 2
  elapsed-time 0
option CLIENTID(1), len 10
  00030001c471fe93b516
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 45
type REPLY(7), xid 3180815
option SERVERID(2), len 10
  00030001002414a33c94
option CLIENTID(1), len 10
  00030001c471fe93b516
option STATUS-CODE(13), len 9
  status code SUCCESS(0)
  status message: SUCCESS
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 3180815
option SERVERID(2), len 10
  00030001002414a33c94
option CLIENTID(1), len 10
  00030001c471fe93b516
option STATUS-CODE(13), len 9
  status code SUCCESS(0)
  status message: SUCCESS
```


Informações Relacionadas

[Entendendo várias opções de DHCP](#)

[Exemplo de configuração de relé de DHCP ASA](#)

[Configurar o ASA para Passar o Tráfego IPv6](#)

[Exemplo de captura de pacote ASA com CLI e configuração ASDM](#)