

ASA : Exemple de configuration du relais DHCPv6 et dépannage

Contenu

[Introduction](#)

[Conditions préalables](#)

[Conditions requises](#)

[Components Used](#)

[Comparaison entre DHCPv6 avec état et DHCPv6 sans état](#)

[Diagramme du réseau](#)

[Types de messages DHCPv6 et DHCPv4](#)

[Relais DHCPv6 sans état](#)

[Configuration](#)

[Flux des paquets](#)

[Vérification](#)

[Débogages](#)

[Instantanés Wireshark](#)

[DHCPv6 avec état](#)

[Configuration](#)

[Flux des paquets](#)

[Vérification](#)

[Débogages](#)

[Instantanés Wireshark](#)

[Dépannage](#)

[Sorties de relais DHCP](#)

[Adresses de libération](#)

[Débogages](#)

[Informations connexes](#)

[Discussions connexes de la communauté d'assistance Cisco](#)

Introduction

Le document décrit comment configurer un dispositif de sécurité adaptatif Cisco (ASA) en tant qu'agent de relais DHCPv6 et couvre également un dépannage de base. Dans les versions 9.0 et ultérieures du code ASA, ASA prend en charge

Conditions préalables

Conditions requises

Cisco vous recommande de prendre connaissance des rubriques suivantes :

- Concepts de base IPv6
- Mécanisme d'adressage IPv6
- Flux de paquets DHCPv6
- Concepts de relais DHCP

Components Used

Les informations de ce document sont basées sur la version 9.1.2 de l'ASA 5500.

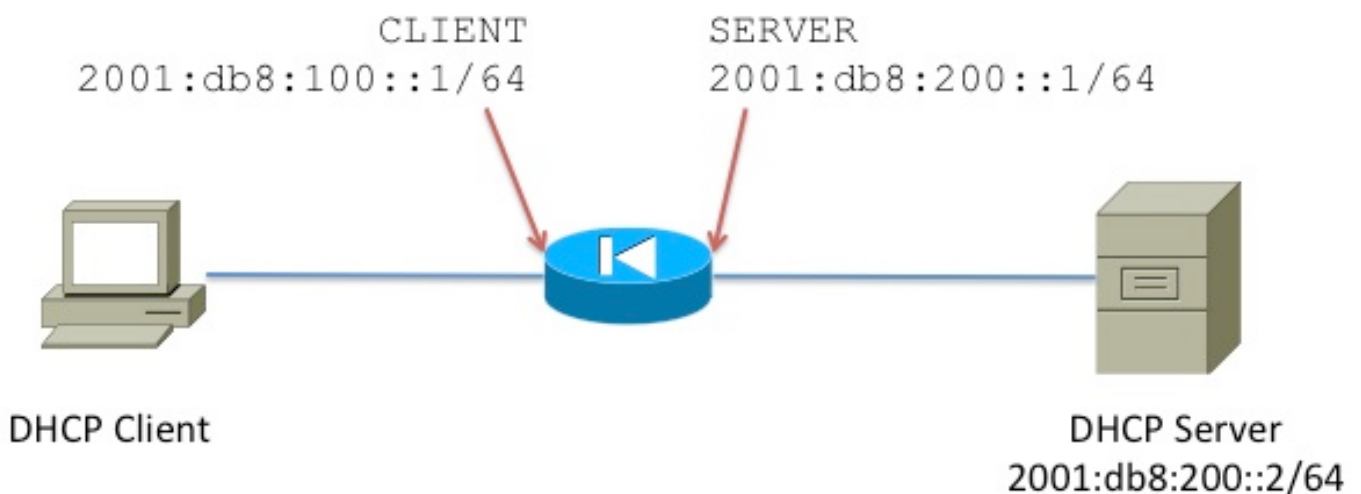
The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.

Comparaison entre DHCPv6 avec état et DHCPv6 sans état

Si vous comprenez les différentes méthodes d'allocation d'adresses dans IPv6, cela vous aide à comprendre comment fonctionne la fonctionnalité de relais DHCPv6 sur l'ASA. Référez-vous à [Affectation dynamique d'adresses IPv6 à l'aide de SLAAC et DHCP](#) pour une introduction à la configuration automatique d'adresses sans état (SLAAC) et DHCPv6.

Diagramme du réseau

Cet exemple de configuration décrit comment configurer l'ASA en tant qu'agent de relais DHCPv6. Dans cette configuration, **CLIENT** est l'interface à laquelle le client IPv6 est connecté. **SERVER** est l'interface par laquelle le serveur DHCPv6 `2001:db8:200::2/64` est accessible.



Types de messages DHCPv6 et 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

Relais DHCPv6 sans état

Configuration

Voici la configuration de base pour la configuration de relais DHCPv6 sans état sur l'ASA :

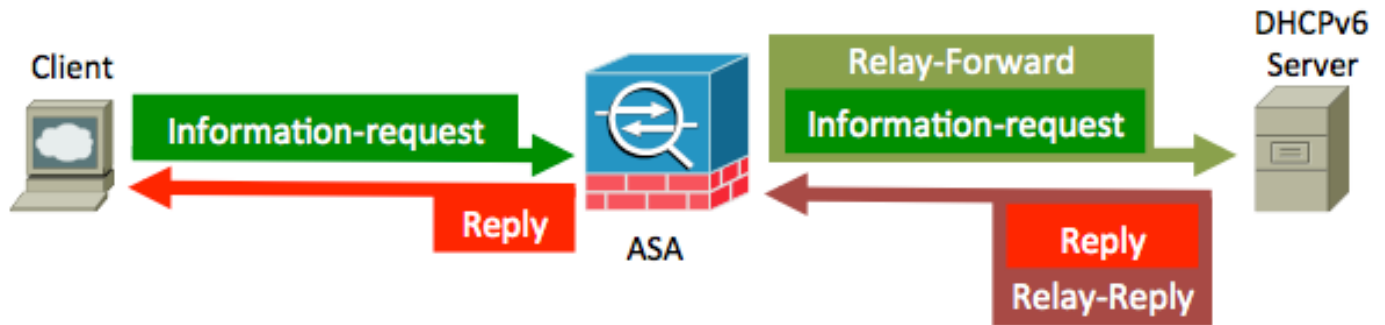
```
interface GigabitEthernet0/1
 nameif CLIENT
 security-level 100
 ipv6 address 2001:db8:100::1/64
 ipv6 enable
 ipv6 nd other-config-flag
!
interface GigabitEthernet0/0
 nameif SERVER
 security-level 0
 ipv6 address 2001:db8:200:1/64
 ipv6 enable
!
ipv6 dhcprelay server 2001:db8:200:2 inside
ipv6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

Flux des paquets

Avec DHCPv6 sans état, voici le flux de paquets du client :



L'ASA intercepte ces paquets et les encapsule dans le format de relais DHCP :



Vérification

Déboguages

Si vous activez **debug ipv6 dhcprelay** et **debug ipv6 dhcp**, les résultats pertinents s'impriment à l'écran. Cette sortie provient d'un scénario de travail :

```
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
```

Dans le paquet de requête INFORMATION-REQUEST, le client demande uniquement **DNS-Server** et **Domain**, ce qui est attendu puisque le client est configuré pour DHCPv6 sans état.

Instantanés Wireshark

Requête client 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) → 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.

Requête DHCP relayée par 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)

Réponse DHCP du serveur

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: 20010db81000000000000000000000000001

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: 05636973636f03636fd00

DNS Domain Search List

Domain: cisco.com **Domain name**

Réponse transférée au client

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: 20010db81000000000000000000000000001

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: 05636973636f03636fd00

DNS Domain Search List

Domain: cisco.com

DHCPv6 avec état

Configuration

Voici la configuration de base pour la configuration de relais DHCPv6 avec état sur l'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

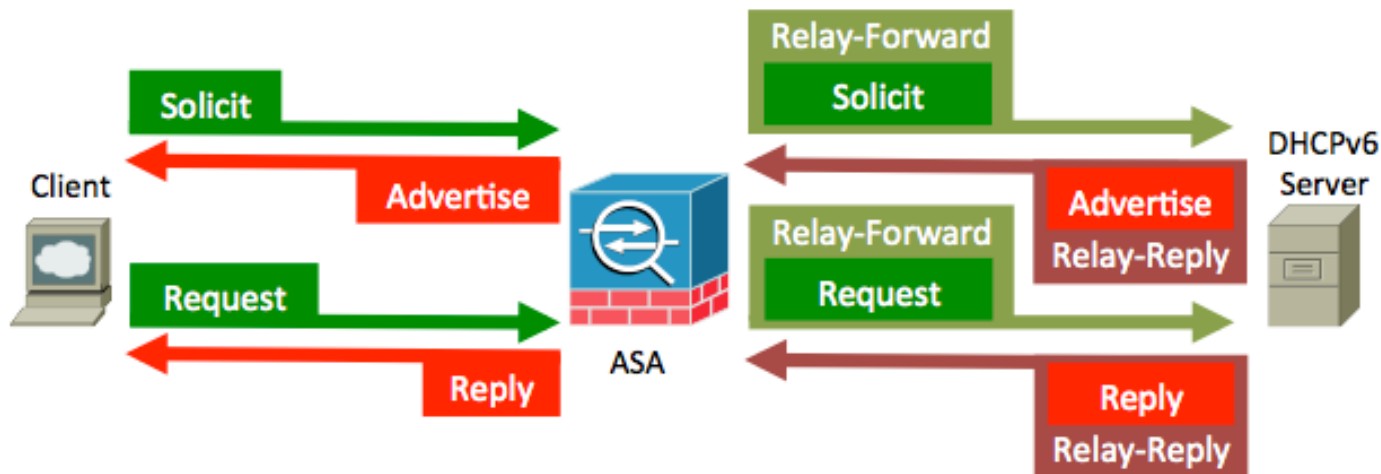
```

Flux des paquets

Avec DHCPv6 avec état, voici le flux de paquets du client :



L'ASA intercepte ces paquets et les encapsule dans le format de relais DHCP :



Vérification

Débogages

```
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

```

Instantanés Wireshark

SOLICITE (1)

Un client DHCPv6 envoie un message de sollicitation afin de localiser les serveurs DHCPv6.

The screenshot shows a network traffic capture in Wireshark. The top pane displays a list of packets, with the first packet being a DHCPv6 SOLICIT message from source fe80::c671:feff:fe93:b51a to destination ff02::1:2. The packet length is 114 bytes. The details pane is expanded to show the following structure:

- 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: sollicit (1):** DHCPv6 client sends a sollicit 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. 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: 0004000100000000000000000000. IAID: 00040001, T1: 0, T2: 0

Annotations in the image highlight the DUID and the Identity Association for Non-temporary Address (IA) fields, with a note stating: "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." and "The client is responsible for creating IAs and requesting that a server assign IPv6 address to IA."

L'ASA relaie le message de sollicitation.

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: 00030001c471fe93b5
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Advertise XID: 0x260139 CID: 00030001c471fe93b5
2001:db8:200::1	2001:db8:200::2	DHCPv6	202		Relay-Forw L: 2001:db8:100::1 Request XID: 0x2609aa CID: 00030001c471fe93b5
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)

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

PUBLICITÉ (2)

Un serveur envoie un message Annonce afin d'indiquer qu'il est disponible pour le service DHCP, en réponse à un message de sollicitation reçu d'un client.

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: 00030001c471fe93b5
2001:db8:200::2	2001:db8:200::1	DHCPv6	223		Relay-reply L: 2001:db8:100::1 Advertise XID: 0x260139 CID: 00030001c471fe93b5
2001:db8:200::1	2001:db8:200::2	DHCPv6	202		Relay-Forw L: 2001:db8:100::1 Request XID: 0x2609aa CID: 00030001c471fe93b5
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: 2001db80300000048ae5f5d8290e926ffffffffffffffffffff

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: 2001db8100

DNS server address: 2001:db8:1000::1 (2001:db8:1000::1) **DNS Server IP Address**

Domain Search List

Option: Domain Search List (24)

Length: 11

Value: 05636973636f03636fd00

DNS Domain Search List

Domain: cisco.com **Domain Name Provided**

Interface-Id

Offered IP Address

DEMANDE (3)

Un client envoie un message Request afin de demander des paramètres de configuration, qui incluent des adresses IP ou des préfixes délégués, à un serveur spécifique.

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


```

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.

RÉPONSE (7)

Un serveur envoie un message de réponse qui contient les adresses et les paramètres de configuration assignés en réponse à un message de sollicitation, de demande, de renouvellement ou de liaison reçu d'un client. Un serveur envoie un message de réponse qui contient des paramètres de configuration en réponse à un message de demande d'informations. Un serveur envoie un message de réponse en réponse à un message de confirmation qui confirme ou refuse que les adresses attribuées au client sont appropriées à la liaison à laquelle le client est connecté. Un serveur envoie un message de réponse afin d'accuser réception d'un message de libération ou de refus.

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: 60120
  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
  
```

Dépannage

Confirmez la connectivité avec le serveur DHCPv6.

```
ciscoasa# show ipv6 neighbor
```

```
IPv6 Address
```

```
Age Link-layer Addr State Interface
```

2001:db8:200::2

0 0024.14a3.3c98 REACH SERVER

Confirmez que vous recevez des paquets du client lorsqu'il demande une adresse IPv6. Le paquet envoyé par le client dépend des paramètres d'affectation d'adresse (c'est-à-dire, stateful vs stateless).

Lorsque le client commence le processus DHCPv6, il envoie un message de sollicitation de routeur afin de détecter la présence de routeurs IPv6 sur la liaison. Il envoie un message de sollicitation de routeur multidiffusion afin d'inviter les routeurs IPv6 à répondre. Dans l'en-tête Ethernet du message de sollicitation de routeur, ces champs s'affichent :

- Le champ Adresse source correspond à l'adresse MAC de l'hôte qui demande l'adresse IPv6.
- Le champ Adresse de destination est défini sur 33-33-00-00-00-02.

Dans l'en-tête IPv6 du message de sollicitation de routeur, ces champs s'affichent.

- Le champ Adresse source est défini sur une adresse IPv6 link-local attribuée à l'interface émettrice ou sur l'adresse IPv6 non spécifiée (::).
- Le champ Adresse de destination est défini sur l'adresse de multidiffusion de tous les routeurs de la portée link-local (FF02::2).
- Le champ Hop Limit est défini sur 255.

En réponse, les routeurs IPv6 envoient des messages d'annonce de routeur non sollicités Le message d'annonce de routeur contient les informations requises par les hôtes afin de déterminer les préfixes de liaison, l'unité de transmission maximale de liaison (MTU) et des routes spécifiques.

```
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.
```

Sorties de relais 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: La liaison est supprimée par l'ASA après une courte période. Ceci est visible dans `debug 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

Adresses de libération

Les clients peuvent libérer leur adresse DHCPv6 attribuée après l'avoir utilisée pour le réseau. La section suivante présente le résultat du débogage associé à la libération d'adresse dans DHCPv6 avec état.

Débuguages

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
```


Informations connexes

[Comprendre les diverses options DHCP](#)

[Exemple de configuration de relais DHCP ASA](#)

[Configurer l'ASA pour transmettre le trafic IPv6](#)

[Exemple de configuration des captures de paquets ASA avec CLI et ASDM](#)