

# ASA: DHCPv6 ليحرت نيوكت لاثم اهحالصإو عاطخأل افاشكتساو

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## المقدمة

يصف المستند كيفية تكوين جهاز الأمان القابل للتكيف (ASA) من Cisco كعميل ترحيل DHCPv6، كما يغطي بعض استكشاف الأخطاء وإصلاحها الأساسية. في الإصدار 9.0 من رمز ASA والإصدارات الأحدث، يدعم ASA

## المتطلبات الأساسية

### المتطلبات

توصي Cisco بأن تكون لديك معرفة بالمواضيع التالية:

- المفاهيم الأساسية ل IPv6

- آلية عنونة IPv6
- تدفق حزم DHCPv6
- مفاهيم ترحيل DHCP

## المكونات المستخدمة

تستند المعلومات الواردة في هذا المستند إلى ASA 5500 الإصدار 9.1.2.

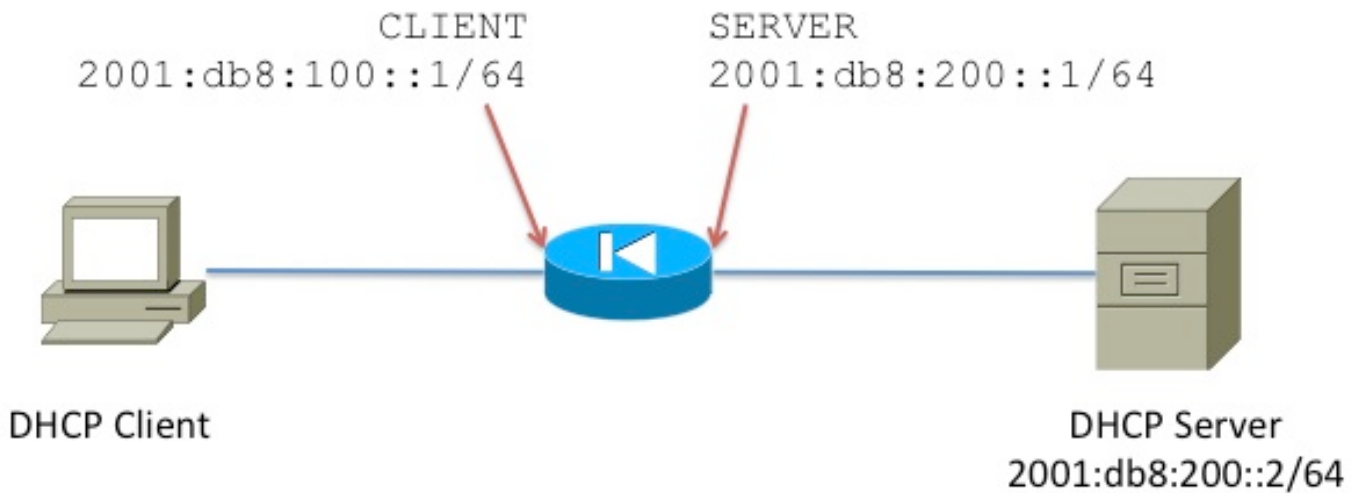
تم إنشاء المعلومات الواردة في هذا المستند من الأجهزة الموجودة في بيئة معملية خاصة. بدأت جميع الأجهزة المستخدمة في هذا المستند بتكوين ممسوح (افتراضي). إذا كانت شبكتك مباشرة، فتأكد من فهمك للتأثير المحتمل لأي أمر.

## DHCPv6 ذو الحالة مقابل عديم الحالة

إذا كنت تفهم الطريقة المختلفة لتخصيص العنوان في IPv6، فإنها تساعدك على فهم كيفية عمل ميزة ترحيل DHCPv6 على ASA. ارجع إلى [تعين العنوان الديناميكي في IPv6 باستخدام SLAAC و DHCP](#) للحصول على مقدمة عن التكوين التلقائي للعنوان عديم الحالة (SLAAC) و DHCPv6.

## الرسم التخطيطي للشبكة

يصف هذا النموذج من التكوين كيفية تكوين ASA كوكيل ترحيل DHCPv6. في هذا التكوين، يكون العميل هو الواجهة التي يتم فيها توصيل عميل IPv6. الخادم هو الواجهة التي من خلالها يمكن الوصول إلى خادم DHCPv6 2001:db8:200::2/64.



## أنواع رسائل DHCPv6 مقابل 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-Fow (12), Relay-Reply (13)	none

## ترحيل DHCPv6 عديم الحالة

### التكوين

وفيما يلي التكوين الأساسي لتكوين ترحيل DHCPv6 عديم الحالة على 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

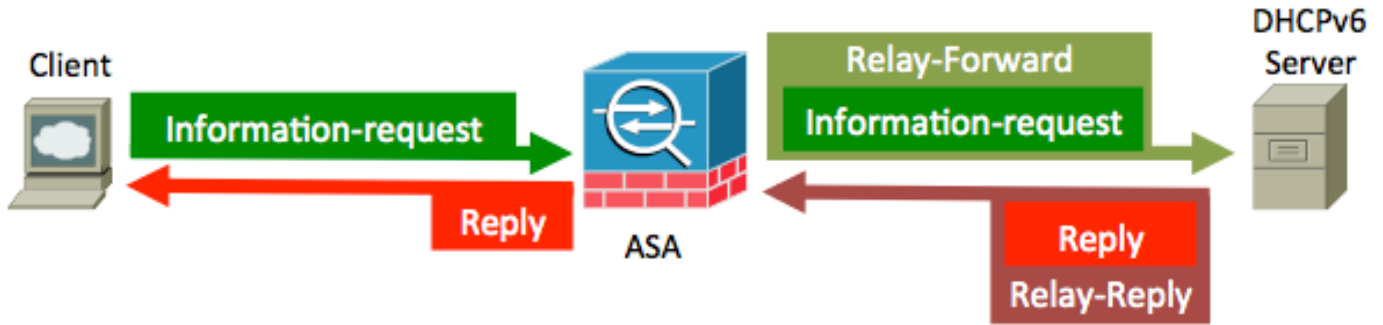
```

### تدفق الحزمة

مع DHCPv6 عديم الحالة، هنا الربط تدفق من الزبون:



يعترض ال ASA هذا ربط ولف هم في ال DHCP ترحيل تنسيق:



## التحقق من الصحة

### تصحيح الأخطاء

إذا قمت بتمكين `debug ipv6 dhcp` و `debug ipv6 dhcprelay`، فعندئذ تتم طباعة المخرجات ذات الصلة على الشاشة. هذا المخرج مأخوذ من سيناريو عمل:

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

```

في حزمة طلب المعلومات، يطلب العميل DNS-Server و Domain فقط، وهو ما هو متوقع نظرا لتكوين العميل ل DHCPv6 عديم الحالة.

## لقطات Wireshark

### طلب عميل 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.

## طلب DHCP الذي تم نقله بواسطة 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)

## رد DHCP من الخادم

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: 87  
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**

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**

Option: Domain Search List (24)  
Length: 11  
Value: 05636973636f03636fd00  
DNS Domain Search List  
Domain: cisco.com **Domain name**

## الرد الذي تمت إعادة توجيهه إلى العميل

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: 05636973636f03636fd00  
DNS Domain Search List  
Domain: cisco.com

## DHCPv6 ذو الحالة

### التكوين

وفيما يلي التكوين الأساسي لتكوين ترحيل DHCPv6 ذو الحالة على 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
```

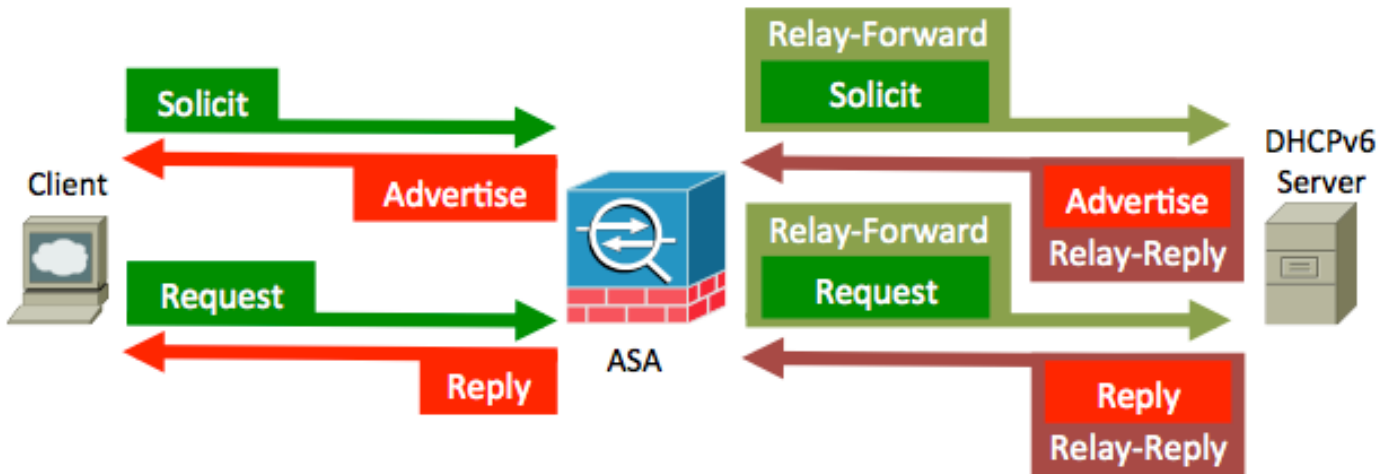
!  
ipv6 dhcprelay server 2001:db8:200:2 inside  
ipv6 dhcprelay enable outside

## تدفق الحزمة

مع DHCPv6 ذو الحالة، وفيما يلي تدفق الحزمة من العميل:



يعترض ال ASA هذا ربط ويلف هم في ال DHCP ترحيل تنسيق:



## التحقق من الصحة

### تصحيح الأخطاء

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

```

## لقطات Wireshark

### شركة (1) Solicit

يرسل عميل DHCPv6 رسالة Solicit لتحديد موقع خوادم DHCPv6.

The screenshot shows a DHCPv6 Solicit message. Key details include:

- Message type:** Solicit (1) - DHCPv6 client sends a solicit message.
- Transaction ID:** 0x260139
- Client Identifier:** DUID: 00030001c471fe93b516. Note: 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.
- Option Request:** Option Request (6) - Requested option codes: DNS recursive name server (23) and Domain search List (24).
- Identity Association for Non-temporary Address:** Option: Identity Association for Non-temporary Address (3) - The client is responsible for creating IAs and requesting that a server assign IPv6 address to IA.

يقوم ASA بإعلام الطالب بالرسالة.

Source	Destination	Protocol	Length	Identification	Info
2001:db8:200::1	2001:db8:200::2	DHCPv6	160		Relay-Forw : 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: 00030001c471fe93b

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

## (2) إعلان

يرسل الخادم رسالة إعلان للإشارة إلى أنها متوفرة لخدمة DHCP، إستجابة لرسالة Solicit تم تلقيها من عميل.

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: 00030001c471fe93b

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
  - IPv6 address: 2001:db8:300:0:48ae:5f5d:8290:e926 (2001:db8:300:0:48ae:5f5d:8290:e926) Offered IP Address**
  - Preferred lifetime: infinity
  - Preferred lifetime: infinity
- DNS recursive name server
  - Option: DNS recursive name server (23)
  - Length: 16
  - Value: 20010db801000000000000000000000000
  - 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

## (3) طلب

يرسل العميل رسالة طلب لطلب معلومات التكوين، التي تتضمن عناوين IP أو البادئات المفوضة، من خادم معين.

```

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.

## (7) الرد

يرسل الخادم رسالة "رد" تحتوي على عناوين معينة ومعلمات تكوين إستجابة لرسالة "طالب" أو "طلب" أو "تجديد" أو "رد" تم تلقيها من عميل. يرسل الخادم رسالة "رد" تحتوي على معلمات تكوين إستجابة لرسالة طلب معلومات. يرسل الخادم رسالة "رد" ردا على رسالة "تأكيد" تؤكد أو ترفض أن العناوين المعنية إلى العميل مناسبة للارتباط الذي يتم اتصال العميل به. يرسل الخادم رسالة "رد" للإقرار باستلام رسالة "إصدار" أو "رفض".

```

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

```

## استكشاف الأخطاء وإصلاحها

تأكيد الاتصال بخادم DHCPv6.

```

ciscoasa# show ipv6 neighbor
IPv6 Address          Age Link-layer Addr State Interface
db8:200::2           0 0024.14a3.3c98 REACH SERVER:2001

```

تأكد من تلقي الحزم من العميل عندما يطلب عنوان IPv6. ستعتمد الحزمة التي يرسلها العميل على إعدادات تعيين العنوان (أي، الحالة مقابل عديم الحالة).

عندما يبدأ العميل عملية DHCPv6، فإنه يرسل رسالة Router Solicit لاكتشاف وجود موجهات IPv6 على الارتباط. وهو يرسل رسالة طلب موجه البث المتعدد من أجل مطالبة موجهات IPv6 بالاستجابة. في رأس الإيثرنت الخاص برسالة التماس الموجه، تعرض هذه الحقول:

- حقل عنوان المصدر هو عنوان MAC للمضيف الذي يطلب عنوان IPv6.
- تم تعيين حقل عنوان الوجهة على 02-00-00-00-33-33.
- في رأس IPv6 لرسالة التماس الموجه، يتم عرض هذه الحقول.

- تم تعيين حقل "عنوان المصدر" إما إلى عنوان IPv6 محلي للارتباط تم تعيينه إلى واجهة الإرسال أو العنوان غير المحدد ل IPv6 (:).
  - تم تعيين حقل عنوان الوجهة إلى عنوان البث المتعدد لكل الموجهات ذات النطاق المحلي (FF02::2).
  - تم تعيين حقل حد الخطوة (Hop) على 255.
- إستجابة، ترسل موجهات IPv6 رسائل إعلان الموجه غير المرغوب فيها تحتوي رسالة إعلان الموجه على المعلومات المطلوبة من الأجهزة المضيفة لتحديد بادئات الارتباط ووحدة الحد الأقصى لإرسال الارتباطات (MTU) ومسارات محددة.

```
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
packets captured 2

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

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

## مخرجات ترحيل DHCP

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

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

ملاحظة: يتم حذف الربط من قبل مكتب المساعدة الفنية بعد فترة قصيرة. وهذا يظهر في `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

## عناوين الإصدار

يمكن للعملاء إصدار العنوان المعين ل DHCPv6 بعد الانتهاء من إستخدامه للشبكة. يظهر القسم التالي إخراج تصحيح الأخطاء المقترن بإصدار العنوان في DHCPv6 ذو الحالة.

### تصحيح الأخطاء

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
```

## معلومات ذات صلة

[فهم خيارات DHCP المختلفة](#)

[مثال تكوين ترحيل ASA DHCP](#)

[تكوين ASA لتتميز حركة مرور IPv6](#)





ةمچرتل هذه لوج

ةللأل تاي نقتل نمة ومة مادختساب دن تسمل اذة Cisco تمةرت  
ملاعلاء انء مء مء نمة دختسمل معد و تمة مء دقتل ةر شبل او  
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