

# لوكوتورب لـ AireOS WLCs ۋە جىلاعەم ۋېفىيەت مەنھۇن DHCP

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## قىمدىق مەلە

مەنھۇن زاھىج يىكلسال Cisco AireOS دەلىمەن DHCP فەلتەخەمەلە ئىلەن قىيىتىۋادە فەصىي.

## يىجراخىلە مەنھۇن DHCP

تاييلم نم نيعضو (WLC) ةيكلساللا (LAN) ةيلحملا ةكبشلا يف مكحتلا ةدحو مع دت  
DHCP مدادخ مادختسا ةلاح يف:

- DHCP عضو لیک ورتب و
  - DHCP عضو طبر

يـف لـضـفـأ مـكـحـتـونـاـمـأ قـيـقـحـتـلـDHCـP دـعـاسـم ةـفـيـظـوـكـLـوـكـوـتـورـبـLـيـكـوـعـضـوـلـمـعـيـلـعـجـيـنـأ رـاـيـخـبـولـسـأ رـسـجـيـDHCـP نـيـيـكـلـسـالـلـاـعـالـمـعـلـاـوـDHCـP مـدـاـخـنـيـبـTـاـكـرـحـيـكـلـسـالـنـوـبـزـلـاـىـلـاـفـافـشـاـيـلـكـةـكـرـحـDHCـP يـفـرـودـمـكـحـتـزـاهـجـلـاـ.

طبول او DHCP لوك وورب ليك و عاصي و ان راقم

طب رعاض و DHCP	لوكوتورب ليڪو عض و DHCP	لـ DHCP
جيaddr ليـ دعـت	معـن	الـ
عـ قـومـ دـ دـ حـ مـ لـ يـ دـ عـ تـ نـ اـ مـ الـ اـ نـ	معـن	الـ
ةـ مـ زـ حـ لـ اـ يـ وـ تـ حـ مـ لـ يـ دـ عـ تـ	معـن	الـ
يـ تـ لـ اـ ةـ رـ كـ مـ لـ اـ ضـ وـ رـ عـ لـ اـ اـ هـ يـ جـ وـ تـ ةـ دـ اـ عـ اـ مـ تـ مـ لـ	معـن	الـ
82 رـ اـ يـ خـ لـ اـ معـ دـ	معـن	الـ
يـ دـ اـ حـ الـ اـ ثـ بـ لـ اـ يـ لـ اـ يـ ثـ بـ لـ اـ	معـن	الـ
معـ دـ بـ Oـ Oـ Tـ Pـ	الـ	مـ دـ اـ خـ لـ اـ
رـ اـ يـ عـ مـ قـ فـ اـ وـ تـ مـ رـ يـ غـ RFC	اـ مـ اـ مـ تـ مـ وـ فـ مـ لـ اـ سـ فـ نـ وـ سـ يـ لـ لـ يـ حـ رـ تـ لـ اـ عـ الـ مـ عـ وـ عـ الـ كـ وـ لـ اـ لـ مـ اـ كـ لـ اـ قـ فـ اـ وـ تـ لـ لـ Lـ Dـ Hـ C~P	الـ

## لوكوتورب ليك و عضو DHCP

DHCP تاکرح عیمجل ردصم لل IP ناوونعک مکحتلا ڈھول یرہاظلا IP ناوونع مادختس امتی ام ڈاع متي .عاوہل ایف DHCP مداخل یقیقحلا IP ناوونع فشکل امتی ال ،کل ذل ڈجیتنو .لیمعلل ،کل ذعمو .مکحتلا ڈھویلع DHCP تاکرح عاطخأ حیحصت جاخا یف اذہ یرہاظلا IP ناوونع ضرع .عالمعل ا نم ڈنیع معاونأ لکاشم ثودح یف یرہاظ IP ناوونع مادختس ا ببستی نأ نکمی

تالوكوتورب نم لکل هسفن کولسلا یلع DHCP لوكوتورب ليکو عضو ئيلمع ظفاحت ۋە ئىلخاتمەن ئامتمەنلا رىيغۇ ۋە ئىلخاتمەنلا لقىنتلار.

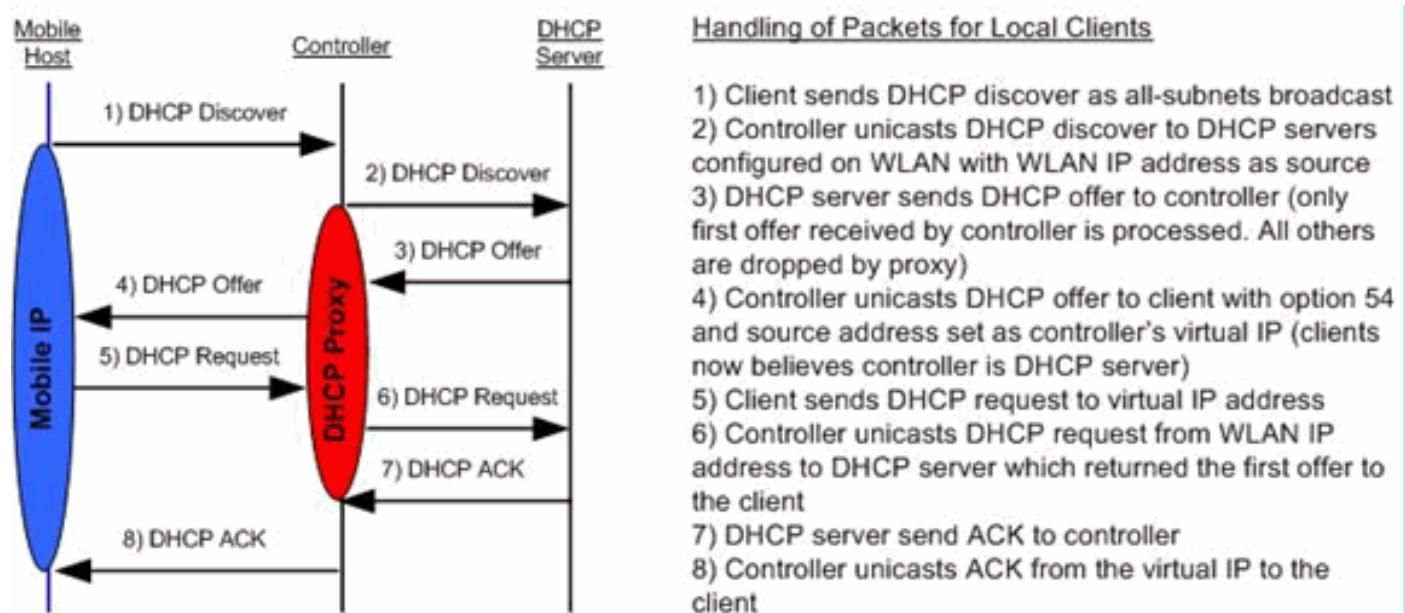
يتأي ضرع لواً ٰداع DHCP ليك و ددحي ، ئيجراخلا DHCP مداوخ نم ٰددع تم ضروع يتأت امدنع

فاك ليغشت متى، كل ذل ٽجيتنو. ليجعلنا تاناييف مداخلاب صاخلا IP ناونع نيعيو دنع. ٽلواحمل ا ٽداعا دعب ٽلماعلم لشفت ٽتح هسفن DHCP مداخل لالخ نم ٽيلاتلا تاكرحلا ليجعلل فلتخم DHCP مداخل ليكولا ددحي، ٽطقنلا هذه.

مكحتلا تادحو عيمج يوتحت نأ بجي. يضارتفا لكتشب DHCP لوكوتورب ليكونيكمت متى هسفن DHCP ليكودادع اىلع لصست يتلا.

 لكشب 82 مقر DHCP رايخ ليغشت لجأ نم لوكوتورب ليكونيكمت بجي: ظحالم حي حص.

## ليكولا مزح قفت

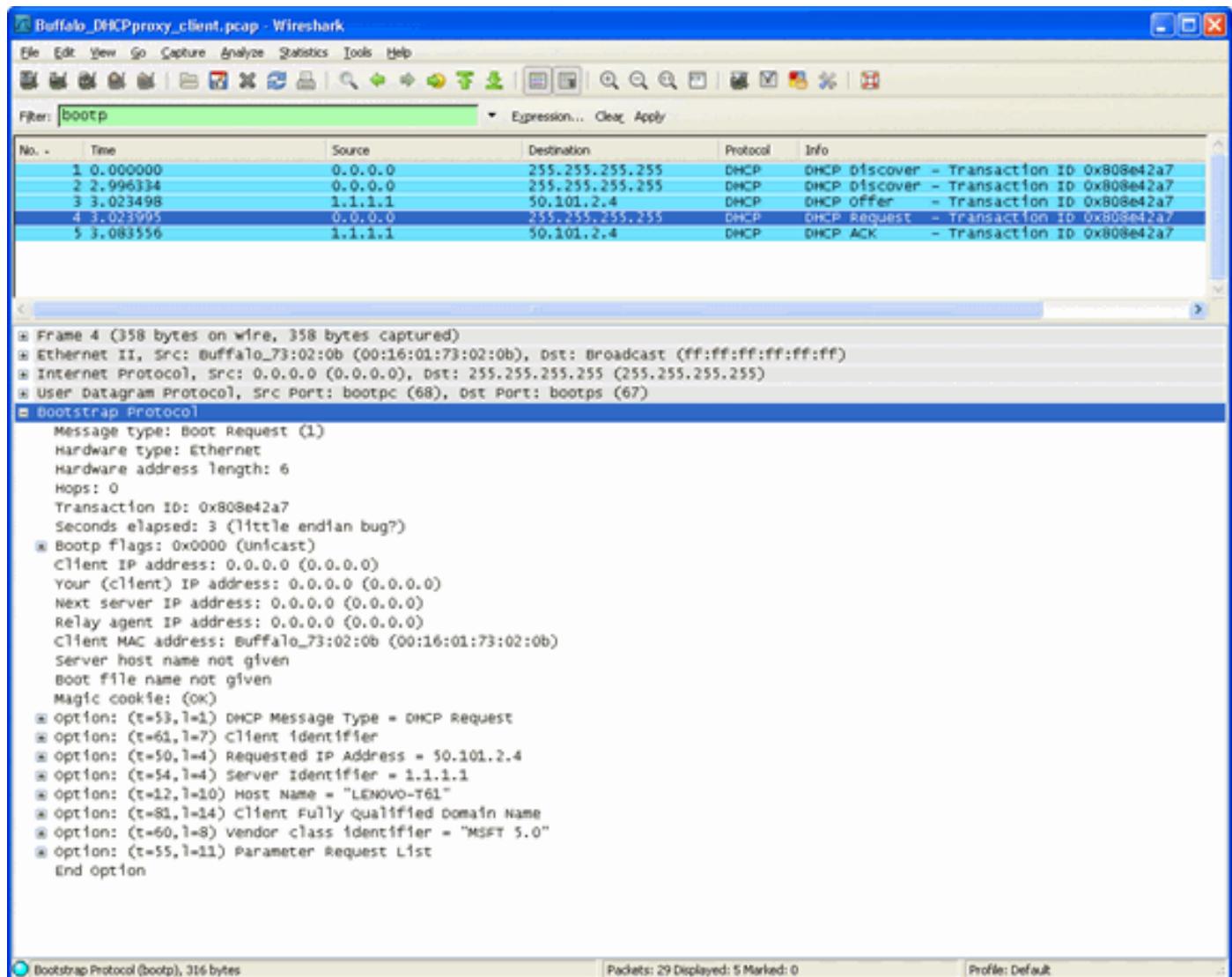


## ليكولا مزح طاقت

مزح ٽيجوتب طقف موقف الاهناف، لوكوتورب ليكوعضويف مكحتلا ٽدحو نوكت امدنع مداخل اهلا هيجوتل ا ٽداعا لفلاپ عاشناب مزح DHCP مزح عاشناب موقت لب DHCP، مداخل اهلا مزح اهلا ليجعللاب ٽصالخا DHCP مزح يف ٽدوجوملا تارايخ عيمج خسن متى DHCP. بلط ٽمزحل رمألا اذه ٽيلاتلا ٽشاشلا ٽطقل ٽلثما حضوت. مكحتلا ٽدحوب ٽصالخا DHCP.

## ليجعللا روظنم

ضرع، DHCP، فاشتكا ضرع. ليجعللا روظنم نم ذوخأم مزح طاقتلا نم يه هذه ٽشاشلا ٽطقل ليصافت عيسوت متى boot p و DHCP بلط زييمت متى DHCP، فرحو، DHCP بلط، تارايخ ضرع يذل او، لوكوتوربلا DHCP.



مداخل روظنم

ضرعي، قباسلا لاثملالثم. مداخلا روظنم نم ذوخأم ڈمزح طاقتلا نم هذه ڈشاشلا ڈطقيل ڈدح و تمافق مزح هذه ف، کل ڈعمو، DHCP ACK، Lاؤس و، DHCP بليط، ضرع، DHCP فاشتکا متي p boot و DHCP بليط زييمت مت ي، يرخأ ڈرم. ليكول ڈفيظوك اهئاشناب مكحتلا ڈمزح يف نالثامتم امهنأ ظحال. DHCP تارايخ ضرع يذلao، لوکوتوربلا ليصافت عيسوت ڈمزحلا ني وانع زربى و ڈمزحلا ليحرتب موقعي WLC ليك و نأ، اضيأ ظحال. ليمعلل DHCP بليط

The figure shows a Wireshark capture window titled "Buffalo\_DHCP\_proxy\_portMirror.pcap - Wireshark". The filter bar at the top contains the text "bootp". The main pane displays a list of network packets. The selected packet (highlighted in blue) is a DHCP Request (Frame 1086). The packet details and bytes panes below it show the structure of the DHCP message, including fields like Transaction ID, Client IP address, and Requested IP Address.

No.	Time	Source	Destination	Protocol	Info
1082	27.458731	50.101.0.11	11.0.0.11	DHCP	DHCP Discover - Transaction ID 0xd4686332
1083	27.459034	11.0.0.11	50.101.0.11	DHCP	DHCP Offer - Transaction ID 0xd4686332
1086	27.459423	50.101.0.11	11.0.0.11	DHCP	DHCP Request - Transaction ID 0xd4686332
1087	27.461641	11.0.0.11	50.101.0.11	DHCP	DHCP ACK - Transaction ID 0xd4686332

Frame 1086 (362 bytes on wire, 362 bytes captured)  
Ethernet II, Src: Cisco\_71:75:07 (00:19:aa:71:75:07), Dst: Cisco\_b2:3d:48 (00:19:e7:b2:3d:48)  
Internet Protocol Version 4, Src: 50.101.0.11 (50.101.0.11), Dst: 11.0.0.11 (11.0.0.11)  
User Datagram Protocol, Src Port: bootps (67), Dst Port: bootps (67)  
Bootstrap Protocol  
Message type: Boot Request (1)  
Hardware type: Ethernet  
Hardware address length: 6  
Hops: 1  
Transaction ID: 0xd4686332  
Seconds elapsed: 0  
Bootp flags: 0x0000 (Unicast)  
Client IP address: 0.0.0.0 (0.0.0.0)  
Your (client) IP address: 0.0.0.0 (0.0.0.0)  
Next server IP address: 0.0.0.0 (0.0.0.0)  
Relay agent IP address: 50.101.0.11 (50.101.0.11)  
Client MAC address: Buffalo\_73:02:0b (00:16:01:73:02:0b)  
Server host name not given  
Boot file name not given  
Magic cookie: (OK)  
Option: (t=53,l=1) DHCP Message Type = DHCP Request  
Option: (t=61,l=7) Client Identifier  
Option: (t=50,l=4) Requested IP Address = 50.101.2.4  
Option: (t=54,l=4) Server Identifier = 11.0.0.11  
Option: (t=12,l=10) Host Name = "LENOVO-T61"  
Option: (t=81,l=14) Client Fully Qualified Domain Name  
Option: (t=60,l=8) Vendor class identifier = "MSFT 5.0"  
Option: (t=55,l=11) Parameter Request List  
End option  
Padding

## لیکولانیوکت لاثم

ةدحو ىلع DHCP ليك و ئيزيم نيكىمت بجى، DHCP ليك ووك مكحتلا ئادحو مادختسا لجا نم اذه CLI رمأ مادختسا نكمى، DHCP ليك و نيكىمتل. ئامس اذه تىنكىم، يىضارتغا لىكشىپ .مكحتلا ئەمئاقد يىف مكحتلا ئادحو ۋەحفص ىلعا (GUA) ئەيموسىرلا مادختسىمىلا ئەجاو يىف رفوتى ھسفن DHCP.

```
<#root>
(Cisco Controller) >
config dhcp proxy enable
(Cisco Controller) >
show dhcp proxy
```

DHCP Proxy Behavior: enabled

بلطتت مكحـت ةـدـحـو ةـهـجـاـوـلـكـ يـلـعـ يـسـاسـأـ مـدـاخـنـيـوـكـتـ بـجـيـ،ـ DHCPـ لـيـكـوـلـمـعـيـ يـكـلـ تـاهـجـاـوـلـاـ يـلـعـ apـmـa~gerـ وـوـ ةـرـادـإـالـاـ ةـهـجـاـوـلـ يـلـعـ DHCPـ مـدـاخـنـيـوـكـتـ نـكـمـيـ .ـ DHCPـ تـامـدـخـ ةـهـجـاـوـلـكـ مـدـاخـنـيـوـكـتـلـ هـذـهـ CLIـ رـمـاـوـ مـادـخـتـسـاـ نـكـمـيـ .ـ ئـيـكـيـمـانـيـدـلـاـ

```
<#root>  
(Cisco Controller) >  
config interface dhcp ap-manager primary
```

```
(Cisco Controller) >  
config interface dhcp management primary
```

```
(Cisco Controller) >  
config interface dhcp dynamic-interface
```

primary

ةدحولخاد DHCP تاکرح عي مجىل ع رثؤت اهن إف كـلـذـلـ، يـمـوـمـعـ دـادـعـاـ يـهـ طـبـرـ ةـزـيمـ نـاـ مـكـحـتـلـاـ.

## اهـالـصـ اوـ اـطـاخـ الـاـ فـاشـ كـتـسـاـ

بلـطـ مـلـتـسـيـ نـأـ مـكـحـتـ زـاهـجـ debugـ dhcpـ packetـ enableـ erasecat4000\_flashـ:ـ لـاـ يـدـبـيـ جـتـانـ وـهـ اـذـ بـلـطـ مـلـتـسـيـ ،ـلـدانـ DHCPـ لـاـ يـلـاـ يـاـ نـاـونـعـ عـمـ نـوـبـزـ نـمـ

DHCPـ لـاـ يـلـاـ يـاـ ضـرـعـ لـسـرـيـوـ،ـلـدانـ DHCPـ لـاـ يـلـاـ يـاـ نـمـ باـجـ.

```
<#root>
```

(Cisco Controller) >

```
debug dhcp message enable
```

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP received op BOOTREQUEST (1)  
(len 312, port 29, encap 0xec03)

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option len (including the magic cookie) 76  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: message type = DHCP REQUEST  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 61 (len 7) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: requested ip = 192.168.4.13  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 12 (len 7) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 81 (len 11) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: vendor class id = MSFT 5.0 (len 8)  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 55 (len 11) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP options end, len 76, actual 68  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP selecting relay 1 - control block settings:  
 dhcpServer: 0.0.0.0, dhcpNetmask: 0.0.0.0,  
 dhcpGateway: 0.0.0.0, dhcpRelay: 0.0.0.0 VLAN: 0

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP selected relay 1 - 192.168.3.1  
(local address 192.168.4.2, gateway 192.168.4.1, VLAN 101, port 29)

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP transmitting DHCP REQUEST (3)

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP op: BOOTREQUEST, htype: Ethernet,  
 hlen: 6, hops: 1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP xid: 0xfc3c9979 (4231829881), secs: 0,  
 flags: 0  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP chaddr: 00:40:96:b4:8c:e1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP ciaddr: 0.0.0.0, yiaddr: 0.0.0.0  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP siaddr: 0.0.0.0, giaddr: 192.168.4.1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP requested ip: 192.168.4.13

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP Forwarding DHCP packet (332 octets)  
-- packet received on direct-connect port requires forwarding to external DHCP  
server. Next-hop is 192.168.4.1

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP sending REQUEST to 192.168.4.1  
(len 350, port 29, vlan 101)

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP selecting relay 2 - control block settings:  
 dhcpServer: 0.0.0.0, dhcpNetmask: 0.0.0.0,  
 dhcpGateway: 0.0.0.0, dhcpRelay: 192.168.4.1 VLAN: 101

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP selected relay 2 - NONE

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP received op BOOTREPLY (2) (len 316, port 29,  
encap 0xec00)

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option len (including the magic cookie) 80  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: message type = DHCP ACK  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 58 (len 4) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 59 (len 4) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: lease time = 691200 seconds  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: server id = 192.168.3.1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: netmask = 255.255.0.0  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: 15 (len 14) - skipping  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: gateway = 192.168.4.1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: DNS server, cnt = 1, first = 192.168.3.1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP option: WINS server, cnt = 1, first = 192.168.3.1  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP options end, len 80, actual 72  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP setting server from ACK (server 192.168.3.1,  
 yiaddr 192.168.4.13)  
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 Assigning Address 192.168.4.13 to mobile

```

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP sending REPLY to STA (len 424, port 29,
vlan 20)
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP transmitting DHCP ACK (5)

Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP      op: BOOTREPLY, htype: Ethernet, hlen: 6,
hops: 0                                         xid: 0xfc3c9979 (4231829881), secs: 0,
Thu Jun 25 21:48:55 2009: 00:40:96:b4:8c:e1 DHCP      flags: 0                                         chaddr: 00:40:96:b4:8c:e1
Thu Jun 25 21:48:59 2009: 00:40:96:b4:8c:e1 DHCP      ciaddr: 0.0.0.0, yiaddr: 192.168.4.13
Thu Jun 25 21:48:59 2009: 00:40:96:b4:8c:e1 DHCP      siaddr: 0.0.0.0, giaddr: 0.0.0.0
Thu Jun 25 21:48:59 2009: 00:40:96:b4:8c:e1 DHCP      server id: 192.0.2.10 rcvd server id: 192.168.3.1

```

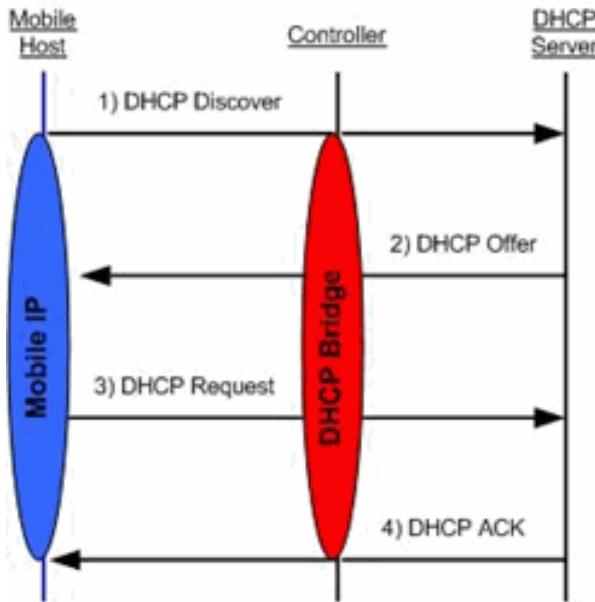
## تاريذحتلا

- ليك ونيكمت عم مكحـت ةـدـحـوـنـيـبـيـنـيـبـلـاـلـيـغـشـتـلـاـةـيـلـبـاـقـلـكـاـشـمـدـجـوتـنـأـنـكـمـيـ  
ىـلـاـحـجـرـأـلـاـىـلـعـكـلـذـعـجـرـيـ.ـDHCـPـمـداـخـوـةـيـامـحـرـادـجـنـمـلـكـلـمـعـتـةـزـهـجـأـوـLـوـكـوـتـورـبـ  
تابـلـطـلـمـاعـلـكـشـبـبـيـجـتـسـتـالـةـيـامـحـلـاـنـارـدـجـنـأـلـزـاهـجـلـابـصـاـخـلـاـةـيـامـحـلـاـرـادـجـنـوـكـمـ  
مـكـحـتـزـاهـجـلـاـىـلـعـلـيـكـوـلـا~workaroundـزـجـعـيـنـأـرـادـصـاـاـذـهـلـاـلـاـلـيـكـوـلـاـ.
- طـاقـسـاـبـمـكـحـتـلـاـةـدـحـوـمـوـقـتـ،ـمـكـحـتـلـاـةـدـحـوـىـلـعـDHCـPـبـلـطـةـلـاحـيـفـلـيـمـعـلـاـنـوـكـيـاـمـدـنـعـ  
بـولـطـمـاـذـهـوـ)ـمـكـحـتـلـاـةـدـحـوـىـلـعـRUNـةـلـاحـيـفـلـيـمـعـلـاـلـخـدـيـاـلـ.ـةـيـمـاـلـعـإـلـاـDHCـPـمـزـحـ  
لـيـمـعـلـاـنـمـDHCـPـفـاـشـتـكـاـةـمـزـحـمـلـتـسـيـىـتـحـ(ـتـاـنـاـيـبـلـاـرـوـرـمـةـكـرـحـرـيـرـمـتـلـلـيـمـعـلـلـ  
لـيـكـوـلـيـطـعـتـدـنـعـمـكـحـتـلـاـةـدـحـوـةـطـسـاـوـبـDHCـPـمـالـعـاـمـزـحـهـيـجـوـتـةـدـاعـاـمـتـتـ
- ليـكـوـدـادـعـاـىـلـعـضـعـبـلـاـاهـضـعـبـبـلـصـتـتـيـتـلـاـمـكـحـتـلـاـنـادـحـوـعـيـمـجـيـوـتـحـتـنـأـبـجـيـ  
هـسـفـنـDHCـPـلـوـكـوـتـورـبـ

## طبـرـعـضـوـDHCـP

لمـاـكـلـاـبـفـافـشـDHCـPـةـلـمـاعـمـيـفـمـكـحـتـلـاـةـدـحـوـرـوـدـلـعـجـلـDHCـPـ طـبـرـةـزـيمـمـيـمـصـتـمـتـ  
نـمـلـيـدـعـتـنـوـدـلـيـمـعـلـاـنـمـمـزـحـلـاـرـسـجـمـتـيـ،ـEthernet~II~ىـلـا~802.11~لـيـوـحـتـعـانـثـتـسـاـبـ.ـلـيـمـعـلـلـ  
ةـصـاـخـلـا~VLAN~ةـكـبـشـقـفـنـىـلـا~(LWAPP)ـفـيـفـخـلـا~نـزـوـلـا~ىـلـا~لـوـصـوـلـا~ةـطـقـنـلـوـكـوـتـورـبـقـفـنـ  
تـالـيـوـحـتـعـانـثـتـسـاـبـ،ـLـ3ـلـاـوـجـتـلـا~ةـلـاحـيـفـ(EoIP)ـرـبـعـتـنـرـثـيـاـوـأـ(ـلـيـمـعـلـاـبـ  
ةـصـاـخـلـا~VLAN~ةـكـبـشـنـمـلـيـدـعـتـنـوـدـلـيـمـعـلـا~ىـلـا~مـزـحـلـا~طـبـرـمـتـيـ،~Ethernet~II~ىـلـا~802.11~لـيـمـعـلـلـ  
يـفـلـيـمـعـلـيـصـوـتـكـاـذـهـرـبـتـعـا~LWAPP~.ـقـفـنـىـلـا~L3~لـاـوـجـتـلـا~ةـلـاحـيـفـEoIP~قـفـنـأـوـأـ(ـلـيـمـعـلـاـبـ  
switchport~DHCـP~ةـلـمـاعـمـذـيـفـنـتـبـلـيـمـعـلـا~مـوـقـيـمـثـةـيـدـيـلـقـتـ.

## لـيـصـوـتـلـا~مـزـحـقـفـدـتـ-~لـوـكـوـتـورـبـنـيـبـ طـبـرـلـا~تـاـيـلـمـعـ



#### Handling of Packets for Local Clients

- 1) Client sends DHCP discover as all-subnets broadcast which is bridged by the controller.
- 2) DHCP server sends DHCP offer to client in a unicast packet.
- 3) Client sends DHCP request as all-subnets broadcast which is bridged by the controller.
- 4) DHCP server send ACK to client in a unicast packet.

## لیمعل روظنم - لیصوتل اومزح طاقتل

Wireshark screenshot showing a captured DHCP transaction:

- Frame 8 (342 bytes on wire, 342 bytes captured)
- Ethernet II, Src: Cisco\_32:7a:40 (00:1a:e3:32:7a:40), Dst: 00:1b:77:23:96:8a (00:1b:77:23:96:8a)
- Internet Protocol, Src: 192.168.10.1 (192.168.10.1), Dst: 192.168.10.120 (192.168.10.120)
- User Datagram Protocol, Src Port: bootps (67), Dst Port: bootpc (68)
- Bootstrap Protocol**
  - Message type: Boot Reply (2)
  - Hardware type: Ethernet
  - Hardware address length: 6
  - Hops: 0
  - Transaction ID: 0x498ae625
  - Seconds elapsed: 0
  - Boot flags: 0x0000 (Unicast)
  - Client IP address: 0.0.0.0 (0.0.0.0)
  - Your (client) IP address: 192.168.10.120 (192.168.10.120)
  - Next server IP address: 0.0.0.0 (0.0.0.0)
  - Relay agent IP address: 0.0.0.0 (0.0.0.0)
  - Client MAC address: 00:1b:77:23:96:8a (00:1b:77:23:96:8a)
  - Server host name not given
  - Boot file name not given
  - Magic cookie: (OK)
  - option: (t=53,l=1) DHCP Message Type = DHCP offer
  - option: (t=54,l=4) Server Identifier = 192.168.10.1
  - option: (t=51,l=4) IP Address Lease Time = 1 day
  - option: (t=58,l=4) Renewal Time Value = 12 hours
  - option: (t=59,l=4) Rebinding Time value = 21 hours
  - option: (t=1,l=4) Subnet Mask = 255.255.255.0
  - option: (t=3,l=4) Router = 192.168.10.1
  - End option

Hex dump of the captured packet:

```

0000  0a 78 00 43 00 44 01 34  67 1c 02 01 06 00 49 88 .x.C.D.4.9.1
0001  e6 23 00 00 00 00 00 00  00 00 c0 48 04 78 00 00
0002  00 00 00 00 00 00 00 00  1b 77 23 96 84 00 00 00
0003  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0004  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0005  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0006  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0007  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0008  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0009  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
000A  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
000B  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
000C  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
000D  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
000E  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
000F  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0010  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0011  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0012  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0013  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0014  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0015  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0016  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0017  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0018  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0019  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
001A  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
001B  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
001C  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
001D  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
001E  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
001F  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0020  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0021  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0022  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0023  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0024  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0025  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0026  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0027  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0028  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0029  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
002A  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
002B  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
002C  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
002D  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
002E  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
002F  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0030  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0031  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0032  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0033  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0034  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0035  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0036  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0037  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0038  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0039  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0040  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0041  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0042  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0043  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0044  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0045  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0046  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0047  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0048  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0049  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0050  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0051  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0052  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0053  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0054  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0055  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0056  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0057  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0058  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0059  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0060  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0061  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0062  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0063  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0064  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0065  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0066  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0069  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0070  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0071  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0072  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0073  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0074  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0075  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0076  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0077  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0078  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0079  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0080  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0081  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0082  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0083  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0084  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0085  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0086  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0087  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0088  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0089  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0090  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0091  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0092  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0097  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0098  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0099  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0100  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0101  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0102  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0103  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0104  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0108  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0110  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0112  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0113  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0114  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0115  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0116  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0117  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0118  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0119  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0120  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0121  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0122  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0123  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0124  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0125  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0148  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
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0150  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0151  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0152  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0153  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0154  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0155  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0156  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0157  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0158  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0159  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0160  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0161  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00
0162  00 00 00 00 00 00 
```

## مداخلاً روظنـم - طـبـرـلـا ـةـمـزـحـ طـاقـتـلـا

DHCPwiredCapture4\_2.pcap - Wireshark

File Edit View Go Capture Analyze Statistics Help

Filter: bootp ▾ Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
39	6.134724	0.0.0.0	255.255.255.255	DHCP	DHCP Request - Transaction ID 0x5f82ee18
40	6.139160	0.0.0.0	255.255.255.255	DHCP	DHCP Request - Transaction ID 0x5f82ee18
41	6.139886	192.168.10.1	192.168.10.104	DHCP	DHCP ACK - Transaction ID 0x5f82ee18
42	6.147306	192.168.10.1	192.168.10.104	DHCP	DHCP ACK - Transaction ID 0x5f82ee18
66	9.047928	192.168.10.104	192.168.10.1	DHCP	DHCP Request - Transaction ID 0x66a1fb2c
67	9.051910	192.168.10.104	192.168.10.1	DHCP	DHCP Request - Transaction ID 0x66a1fb2c
68	9.052548	192.168.10.1	192.168.10.104	DHCP	DHCP ACK - Transaction ID 0x66a1fb2c
69	9.057076	192.168.10.1	192.168.10.104	DHCP	DHCP ACK - Transaction ID 0x66a1fb2c

Frame 40 (356 bytes on wire, 356 bytes captured)  
 Ethernet II, Src: Aironet\_b6:44:51 (00:40:96:b6:44:51), Dst: Broadcast (ff:ff:ff:ff:ff:ff)  
 Internet Protocol, Src: 0.0.0.0 (0.0.0.0), Dst: 255.255.255.255 (255.255.255.255)  
 User Datagram Protocol, Src Port: bootpc (68), Dst Port: bootps (67)  
 Bootstrap Protocol  
 Message type: Boot Request (1)  
 Hardware type: Ethernet  
 Hardware address length: 6  
 Hops: 0  
 Transaction ID: 0x5f82ee18  
 Seconds elapsed: 0  
 Bootp flags: 0x0000 (Unicast)  
 Client IP address: 0.0.0.0 (0.0.0.0)  
 Your (client) IP address: 0.0.0.0 (0.0.0.0)  
 Next server IP address: 0.0.0.0 (0.0.0.0)  
 Relay agent IP address: 0.0.0.0 (0.0.0.0)  
 Client MAC address: Aironet\_b6:44:51 (00:40:96:b6:44:51)  
 Server host name not given  
 Boot file name not given  
 Magic cookie: (ok)  
 Option: (t=53,l=1) DHCP Message Type = DHCP Request  
 Option: (t=61,l=7) client identifier  
 Option: (t=50,l=4) Requested IP Address = 192.168.10.104  
 Option: (t=12,l=12) Host Name = "cisco-ibm-xp"  
 Option: (t=81,l=16) client Fully qualified Domain Name  
 Option: (t=60,l=8) Vendor class identifier = "MSFT 5.0"  
 Option: (t=55,l=11) Parameter Request List  
 End option

DHCP بـلـطـبـيـه 40 ـقـمـحـلـاـ نـأـىـرـتـ نـأـ كـنـكـمـيـ ةـيـكـلـسـلـاـ ـقـمـحـلـاـ طـاقـتـلـاـ ةـشـاشـ ةـطـقـلـ يـفـ ةـيـكـلـسـلـاـ ةـكـبـشـلـاـ ـىـلـاـ 00:40:96:b6:44:51 رـابـتـخـالـاـ لـيـمـعـ نـمـ رـسـجـمـلـاـ.

## لاثم لیکشت رسجي

ىلع DHCP لىك و ئازىم لي طمعت كىلىع بجى ، مكحتلا ۋە دەحۋىلىع طبرە ئەفي ظونى كەمتل ئەيلاتلا رام اوالا عم CLI يە قەف كەلذ قىيقت نەكمى . مكحتلا ۋە دەحۋ

```
<#root>  
  
(Cisco Controller) >  
config dhcp proxy disable  
  
(Cisco Controller) >  
show dhcp proxy  
  
DHCP Proxy Behaviour: disabled
```

بجييف، لي明珠اب ةصالخا اهسفن (L2) 2 ئقىبطلا ئكبسىلىع ادوچوم DHCP مداخنىكى مل اذى نم ئنېيغ ھذە دعاسم مادختسى لالخ نم لي明珠ا ئباوب يف DHCP مداخىلىا هيچوت ئداعا نىوكتلا اذە:

```
<#root>
Switch#
conf t
Switch(config)#
interface vlan

Switch(config-if)#
ip helper-address
```

ةدحو لخاد DHCP تاکرح عي مجىلىع رثؤت اهنإف كىلذل، يمومع دادعاي هـ DHCP طبر ئزيـم نـا تاكـبـشـ عـيـمـجـلـ ئـيـكـلـسـلـاـ ئـيـسـاسـأـلـاـ ئـيـنـبـلـاـ يـفـ IPـ دـعـاسـمـ تـارـابـعـ ئـفـاـضـاـ بـجـيـ .ـمـكـحـتـلـاـ ئـدـحـوـ ئـلـعـ ئـيـرـوـرـضـلـاـ VLANـ.

## اهالص او ئاطخالا فاشكتسا

مكحتلا ئدحوب ةصالخا (CLI) رماوألا رطس ئهجاولىع انه ئجردملا ئاطخالا حي حصت نيكى مت دنتسملاندا اذەل جاخىلا نم DHCP ئزج جارختسى متو.

```
<#root>
(Cisco Controller) >
debug client 00:40:b6:44:51
(Cisco Controller) >
debug dhcp message enable

00:40:b6:44:51 DHCP received op BOOTREQUEST (1) (len 308, port 1, encapsulation 0xec03)
00:40:b6:44:51 DHCP option len (including the magic cookie) 72
```

```
00:40:96:b6:44:51 DHCP option: message type = DHCP DISCOVER
00:40:96:b6:44:51 DHCP option: 116 (len 1) - skipping
00:40:96:b6:44:51 DHCP option: 61 (len 7) - skipping
00:40:96:b6:44:51 DHCP option: 12 (len 12) - skipping
00:40:96:b6:44:51 DHCP option: vendor class id = MSFT 5.0 (len 8)
00:40:96:b6:44:51 DHCP option: 55 (len 11) - skipping
00:40:96:b6:44:51 DHCP options end, len 72, actual 64
00:40:96:b6:44:51 DHCP processing DHCP DISCOVER (1)
00:40:96:b6:44:51 DHCP    op: BOOTREQUEST, htype: Ethernet, hlen: 6, hops: 0
00:40:96:b6:44:51 DHCP    xid: 0x224dfab6 (575535798), secs: 0, flags: 0
00:40:96:b6:44:51 DHCP    chaddr: 00:40:96:b6:44:51
00:40:96:b6:44:51 DHCP    ciaddr: 0.0.0.0, yiaddr: 0.0.0.0
00:40:96:b6:44:51 DHCP    siaddr: 0.0.0.0, giaddr: 0.0.0.0

00:40:96:b6:44:51 DHCP successfully bridged packet to DS

00:40:96:b6:44:51 DHCP received op BOOTREPLY (2) (len 308, port 1, encapsulation 0xec00)
00:40:96:b6:44:51 DHCP option len (including the magic cookie) 72
00:40:96:b6:44:51 DHCP option: message type = DHCP OFFER

00:40:96:b6:44:51 DHCP option: server id = 192.168.10.1

00:40:96:b6:44:51 DHCP option: lease time = 84263 seconds
00:40:96:b6:44:51 DHCP option: 58 (len 4) - skipping
00:40:96:b6:44:51 DHCP option: 59 (len 4) - skipping
00:40:96:b6:44:51 DHCP option: netmask = 255.255.255.0
00:40:96:b6:44:51 DHCP option: gateway = 192.168.10.1
00:40:96:b6:44:51 DHCP options end, len 72, actual 64
00:40:96:b6:44:51 DHCP processing DHCP OFFER (2)
00:40:96:b6:44:51 DHCP    op: BOOTREPLY, htype: Ethernet, hlen: 6, hops: 0
00:40:96:b6:44:51 DHCP    xid: 0x224dfab6 (575535798), secs: 0, flags: 0
00:40:96:b6:44:51 DHCP    chaddr: 00:40:96:b6:44:51
00:40:96:b6:44:51 DHCP    ciaddr: 0.0.0.0, yiaddr: 192.168.10.104
00:40:96:b6:44:51 DHCP    siaddr: 0.0.0.0, giaddr: 0.0.0.0
00:40:96:b6:44:51 DHCP    server id: 192.168.10.1 rcvd server id: 192.168.10.1

00:40:96:b6:44:51 DHCP successfully bridged packet to STA

00:40:96:b6:44:51 DHCP received op BOOTREQUEST (1) (len 328, port 1, encapsulation 0xec03)
00:40:96:b6:44:51 DHCP option len (including the magic cookie) 92
00:40:96:b6:44:51 DHCP option: message type = DHCP REQUEST
00:40:96:b6:44:51 DHCP option: 61 (len 7) - skipping
00:40:96:b6:44:51 DHCP option: requested ip = 192.168.10.104
00:40:96:b6:44:51 DHCP option: server id = 192.168.10.1
00:40:96:b6:44:51 DHCP option: 12 (len 12) - skipping
00:40:96:b6:44:51 DHCP option: 81 (len 16) - skipping
00:40:96:b6:44:51 DHCP option: vendor class id = MSFT 5.0 (len 8)
00:40:96:b6:44:51 DHCP option: 55 (len 11) - skipping
00:40:96:b6:44:51 DHCP options end, len 92, actual 84
00:40:96:b6:44:51 DHCP processing DHCP REQUEST (3)
00:40:96:b6:44:51 DHCP    op: BOOTREQUEST, htype: Ethernet, hlen: 6, hops: 0
00:40:96:b6:44:51 DHCP    xid: 0x224dfab6 (575535798), secs: 0, flags: 0
00:40:96:b6:44:51 DHCP    chaddr: 00:40:96:b6:44:51
00:40:96:b6:44:51 DHCP    ciaddr: 0.0.0.0, yiaddr: 0.0.0.0
00:40:96:b6:44:51 DHCP    siaddr: 0.0.0.0, giaddr: 0.0.0.0
00:40:96:b6:44:51 DHCP    requested ip: 192.168.10.104
00:40:96:b6:44:51 DHCP    server id: 192.168.10.1 rcvd server id: 192.168.10.1

00:40:96:b6:44:51 DHCP successfully bridged packet to DS

00:40:96:b6:44:51 DHCP received op BOOTREPLY (2) (len 308, port 1, encapsulation 0xec00)
00:40:96:b6:44:51 DHCP option len (including the magic
cookie) 72 00:40:96:b6:44:51 DHCP option: message type = DHCP ACK
00:40:96:b6:44:51 DHCP option: server id = 192.168.10.1
```

```
00:40:96:b6:44:51 DHCP option: lease time = 86400 seconds
00:40:96:b6:44:51 DHCP option: 58 (len 4) - skipping
00:40:96:b6:44:51 DHCP option: 59 (len 4) - skipping
00:40:96:b6:44:51 DHCP option: netmask = 255.255.255.0
00:40:96:b6:44:51 DHCP option: gateway = 192.168.10.1
00:40:96:b6:44:51 DHCP options end, len 72, actual 64
00:40:96:b6:44:51 DHCP processing DHCP ACK (5)
00:40:96:b6:44:51 DHCP      op: BOOTREPLY, htype: Ethernet, hlen: 6, hops: 0
00:40:96:b6:44:51 DHCP      xid: 0x224dfab6 (575535798), secs: 0, flags: 0
00:40:96:b6:44:51 DHCP      chaddr: 00:40:96:b6:44:51
00:40:96:b6:44:51 DHCP      ciaddr: 0.0.0.0, yiaddr: 192.168.10.104
00:40:96:b6:44:51 DHCP      siaddr: 0.0.0.0, giaddr: 0.0.0.0
00:40:96:b6:44:51 DHCP      server id: 192.168.10.1 rcvd server id: 192.168.10.1

00:40:96:b6:44:51 Assigning Address 192.168.10.104 to mobile
00:40:96:b6:44:51 DHCP successfully bridged packet to STA
00:40:96:b6:44:51 192.168.10.104 Added NPU entry of type 1
```

- نم ۋىلص ألا DHCP ۋە مزح نأ ينعي اذه - DS ىلى حاجنب ۋە مزحلا لىيصوتب DHCP ماق ۋە يىتحىللا ۋە يىنبلۇ DS (DS). عىزوتلا ماظن ىلى اهلى دعىت نود، اهمىسىقىت مەت لىيىمعەللا ۋە يىكىلسلىا.
  - ۋە مزح رىسج مەت ھنأ ىلى ئەلسىرلا ھذە رېشىت - STA ىلى ۋە مزحلا لىيصوت يىف DHCP حەجن DHCP بىلەتىپ يىذلا لىيىمعەللا زاھىج وە طەحملە ىلى رىييغىت نود،

تاریذحتل

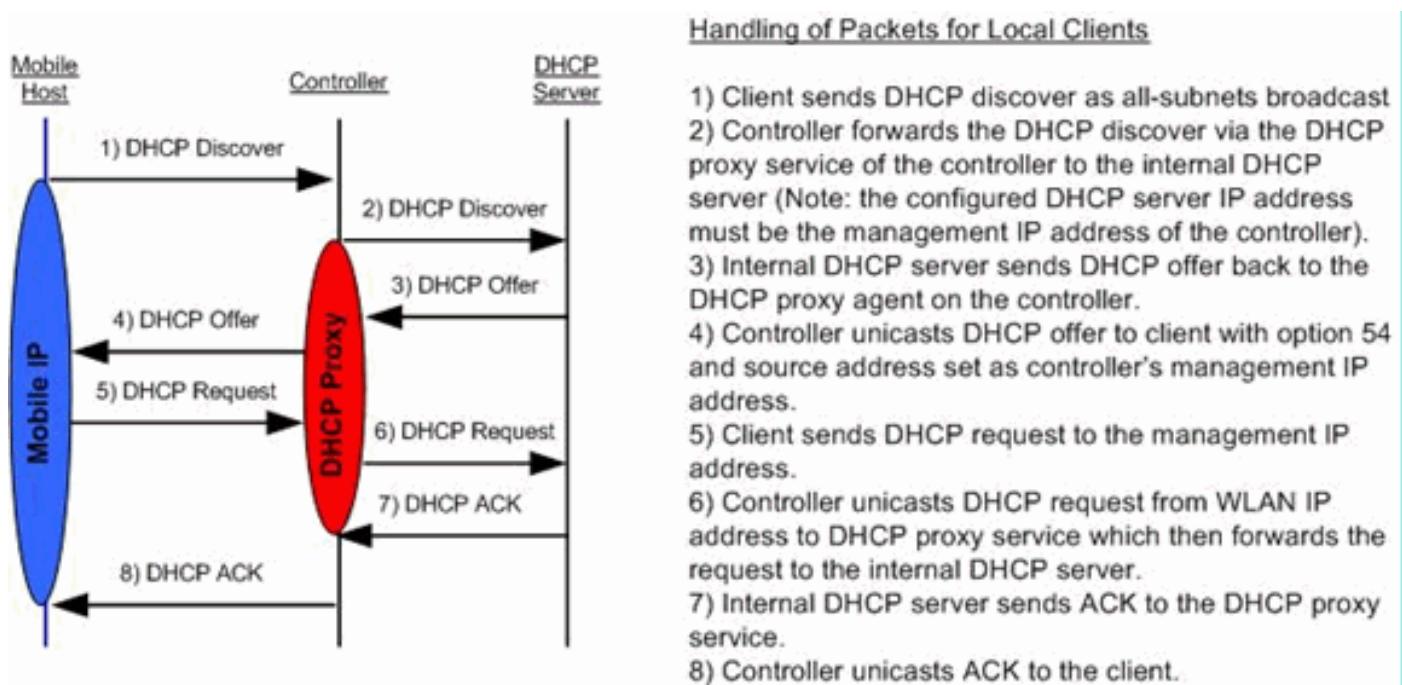
- لیکونیکمٽ مٽی، یضاٽف الکشپ DHCP.
  - لیکو دادع ایل ع ضعبل اهضعبب لصتت یتل امکحٽلا تادح و عیمج یوتحت نأ بجی سفن DHCP لوكوتورب.
  - لمعیل 82 DHCP رایخ لوكوتورب لیکونیکمٽ بجی.

## یہلخا د DHCP م دا خ

طبول او ئىلخادى DHCP عاچىۋا نىب ئن راقم

ع م رسجي DHCP وأليكو DHCP ام! مكحت زاهجل اىل ع بولسأ يسيئر نانثا لـ DHCP  
ىلا DHCP ـمزح يتـأتـ لـ قـتسـم APs عـم يـفلـخ DHCP لـ ثـم رـثـكـأ لـ معـي مـكـحت زـاهـجـلـا رسـجي  
ـكـبـشـبـ طـبـتـرـمـلـا (SSID) ـمـدـخـلـا ـعـوـمـجـمـ فـرـعـمـبـ لـ يـمـعـ نـارـتـقـاـ لـ الـخـ نـمـ لـ وـصـوـلـاـ ظـقـنـ  
ـVLANـ.ـ  
ـ(L3)ـ ـقـقـبـطـلـاـ ةـبـاـوبـ اـىـلـ عـ دـعـاـسـمـ فـيـرـعـتـ مـتـ اـذـاـ DHCPـ نـأـ ـمـزـحـ جـرـخـتـ،ـ كـلـ ذـعـبـ  
ـدـعـبـ .ـهـجـوـمـلـاـ يـدـاحـأـلـاـ ثـبـلـاـ رـبـعـ اـهـ دـمـاـخـ اـلـاـ ـمـزـحـ لـاـ هـيـجـوـتـ ـدـاعـاـ مـتـ،ـ هـذـهـ VLANـ ـكـبـشـلـ  
ـكـلـتـ DHCPـ ـمـزـحـ هـيـجـوـتـ تـدـاعـاـيـتـلـاـ L3ـ ـهـجـاـوـ اـىـلـاـ ـرـشـابـمـ DHCPـ مـدـاخـ بـيـجـتـسـيـ،ـ كـلـ ذـ  
ـرـشـابـمـ هـيـجـوـتـلـاـ ـدـاعـاـ عـيـمـجـ عـارـجـ اـمـتـيـ نـكـلـوـ،ـ ةـرـكـفـلـاـ سـفـنـ يـهـ نـوـكـتـ،ـ DHCPـ لـيـكـوـ مـادـخـتـسـابـ  
ـىـلـاـ DHCPـ بـلـطـ يـتـأـيـ،ـ لـاثـمـلـاـ لـيـبـسـ اـىـلـ عـ VLANـ ـكـبـشـلـ L3ـ ـهـجـاـوـ نـمـ الـدـبـ مـكـحتـلـاـ ـدـحـوـلـعـ  
ـةـيـكـلـسـاـلـلـاـ ـيـلـحـمـلـاـ ـكـبـشـلـاـ مـثـ،ـ لـيـمـعـلـاـ نـمـ (WLANـ)ـ ـيـكـلـسـاـلـلـاـ ـيـلـحـمـلـاـ ـكـبـشـلـاـ  
ـزـواـجـتـ ـفـيـظـوـ مـدـخـتـسـتـ \*ـوـأـيـاـ VLANـ ـكـبـشـ ـهـجـاـوـ اـىـلـ عـ دـدـحـمـلـاـ DHCPـ مـدـاخـ مـدـخـتـسـتـ اـمـاـ (WLANـ)  
ـلـقـحـ مـادـخـتـسـابـ DHCPـ مـدـاخـ اـلـاـ ثـبـلـاـ ـهـيـجـوـتـ ـدـاعـاـلـ WLANـ ـكـبـشـلـ DHCPـ مـادـخـتـسـابـ  
ـةـكـبـشـ ـهـجـاـوـلـ IPـ نـاوـنـعـ نـوـكـيـلـ هـوـلـمـ مـتـ يـذـلـاـ DHCPـ مـزـحـلـ VLANـ.

## مزنحلا قفت - يلخادل DHCP مدادخ



لایخادل DHCP لدان لیکشت ایملا

لـمـعـلـاب يـلـخـادـلـا DHCP مـدـاـخـلـا مـكـحـتـلـا ةـدـحـوـلـعـ لـيـكـوـنـيـكـمـتـ كـيـلـعـ بـجـيـ مـسـقـلـا اـذـهـ نـمـضـ (GUI) ةـيـمـوسـرـلـا مـدـخـتـسـمـلـا ةـهـجـ اوـرـبـعـ كـلـذـبـ مـاـيـقـلـا نـكـمـيـ

 عي مج يف (GUI) ةيموسرلا مدخلتسملأا ٥هـج او ربـع DHCP ليـكـوـنـيـعـتـ كـنـكـمـيـ الـ ظـاحـلـمـ تـارـادـصـ الـاـ.

## DHCP Parameters

Enable DHCP Proxy	<input checked="" type="checkbox"/>
DHCP Option 82 Remote Id field format	AP-MAC

## رماؤلا رطس ٥٥ جاو رباع و

Config dhcp proxy enable  
Save config

اذه لدان DHCP ىلخادلا تنكىم steps: in order to تممتا

1. رقنا New. (Controller > Internal DHCP Server > DHCP Scope). IP نیوانع بحسل ۵م دختست یذلا قاطنلا ددج.

Scope Name	User Scope		
Pool Start Address	192.168.100.100		
Pool End Address	192.168.100.200		
Network	192.168.100.0		
Netmask	255.255.255.0		
Lease Time (seconds)	86400		
Default Routers	192.168.100.1	0.0.0.0	0.0.0.0
DNS Domain Name	wlc2106.local		
DNS Servers	0.0.0.0	0.0.0.0	0.0.0.0
Netbios Name Servers	0.0.0.0	0.0.0.0	0.0.0.0
Status	Enabled ▾		

ك. ب ظا خلا

WLANS > Edit < Back

General Security QoS Advanced

Allow AAA Override	<input type="checkbox"/> Enabled	DHCP
Coverage Hole Detection	<input checked="" type="checkbox"/> Enabled	DHCP Server <input checked="" type="checkbox"/> Override
Enable Session Timeout	<input checked="" type="checkbox"/> 1800 Session Timeout (secs)	192.168.100.254 DHCP Server IP Addr
Aironet IE	<input checked="" type="checkbox"/> Enabled	DHCP Addr. Assignment <input type="checkbox"/> Required
Diagnostic Channel	<input type="checkbox"/> Enabled	Management Frame Protection (MFP)
IPv6 Enable	<input type="checkbox"/>	Infrastructure MFP Protection <input checked="" type="checkbox"/>
Override Interface ACL	None	MFP Client Protection <input type="checkbox"/> Optional
P2P Blocking Action	Disabled	DTIM Period (in beacon intervals)
Client Exclusion <small>4</small>	<input checked="" type="checkbox"/> Enabled	802.11a/n (1 - 255) <input type="checkbox"/> 1
VoIP Snooping and Reporting	<input type="checkbox"/>	802.11b/g/n (1 - 255) <input type="checkbox"/> 1
HREAP		NAC
H-REAP Local Switching <small>3</small>	<input type="checkbox"/> Enabled	State <input type="checkbox"/> Enabled
Learn Client IP Address <small>5</small>	<input checked="" type="checkbox"/> Enabled	

3. ل ي ك و ن ي ك م ت ن م د ك أ ت .

DHCP Parameters

Enable DHCP Proxy <input checked="" type="checkbox"/>
DHCP Option 82 Remote Id field format AP-MAC

اه ح ا ل ص او ء ا ط خ ا ل ا ف ا ش ك ت س ا

ل وص ح ل ا ي ف ة ل ك ش م ه ي د ل ل ي م ع ي ل ع ر و ث ع ل ا ة د اع ي ل خ ا د ل ا DHCP م د اخ ء ا ط خ ا ح ي ح ص ت ب ل ط ت ي ذ ه ء ا ط خ ا ل ا ح ي ح ص ت ت ا ي ل م ع ل ي غ ش ت ب ج ي . IP ن ا و ن ع ي ل ع

```
debug client <MAC ADDRESS OF CLIENT>
```

ىلע طقف ئاطخالا حىحصت زكري امنىب كل ئاطخالا ھذه نكمي وركام وھ ئاطخالا حىحصت لىمع ھتلخدا يذلا لىمعلاپ ساچالا MAC ناونع.

```
debug dhcp packet enable
debug dot11 mobile enable
debug dot11 state enable
debug dot1x events enable
debug pem events enable
debug pem state enable
debug cckm client debug enable
```

ایئاقلت ھنیکم ت متي يذلا رمألا debug dhcp packet enable لئاسمل يسیئرلا ببسلا ۋە ئەطس اوپ debug client erasecat4000 flash:

<#root>

```
00:1b:77:2b:cf:75 dhcpd: received DISCOVER

00:1b:77:2b:cf:75 dhcpd: Sending DHCP packet (giaddr:192.168.100.254)to 127.0.0.1:67
from 127.0.0.1:1067

00:1b:77:2b:cf:75 sendto (548 bytes) returned 548
00:1b:77:2b:cf:75 DHCP option len (including the magic cookie) 312

00:1b:77:2b:cf:75 DHCP option: message type = DHCP OFFER

00:1b:77:2b:cf:75 DHCP option: server id = 192.168.100.254
00:1b:77:2b:cf:75 DHCP option: lease time = 86400 seconds
00:1b:77:2b:cf:75 DHCP option: gateway = 192.168.100.1
00:1b:77:2b:cf:75 DHCP option: 15 (len 13) - skipping
00:1b:77:2b:cf:75 DHCP option: netmask = 255.255.255.0
00:1b:77:2b:cf:75 DHCP options end, len 312, actual 64
00:1b:77:2b:cf:75 DHCP option len (including the magic cookie) 81

00:1b:77:2b:cf:75 DHCP option: message type = DHCP REQUEST

00:1b:77:2b:cf:75 DHCP option: 61 (len 7) - skipping
00:1b:77:2b:cf:75 DHCP option: requested ip = 192.168.100.100
00:1b:77:2b:cf:75 DHCP option: server id = 192.0.2.10
00:1b:77:2b:cf:75 DHCP option: 12 (len 14) - skipping
00:1b:77:2b:cf:75 DHCP option: vendor class id = MSFT 5.0 (len 8)
00:1b:77:2b:cf:75 DHCP option: 55 (len 11) - skipping
00:1b:77:2b:cf:75 DHCP option: 43 (len 3) - skipping
00:1b:77:2b:cf:75 DHCP options end, len 81, actual 73
00:1b:77:2b:cf:75 DHCP Forwarding packet locally (340 octets) from 192.168.100.254 to
192.168.100.254
dhcpd: Received 340 byte dhcp packet from 0xfe64a8c0 192.168.100.254:68

00:1b:77:2b:cf:75 dhcpd: packet 192.168.100.254 -> 192.168.100.254 using scope "User Scope"

00:1b:77:2b:cf:75 dhcpd: received REQUEST

00:1b:77:2b:cf:75 Checking node 192.168.100.100 Allocated 1246985143, Expires 1247071543
(now: 1246985143)
```

```
00:1b:77:2b:cf:75 dhcpd: server_id = c0a864fe
00:1b:77:2b:cf:75 dhcpd: server_id = c0a864fe adding option 0x35 adding option 0x36
   adding option 0x33 adding option 0x03 adding option 0x0f adding option 0x01

00:1b:77:2b:cf:75 dhcpd: Sending DHCP packet (giaddr:192.168.100.254)to 127.0.0.1:67
   from 127.0.0.1:1067

00:1b:77:2b:cf:75 sendto (548 bytes) returned 548
00:1b:77:2b:cf:75 DHCP option len (including the magic cookie) 312

00:1b:77:2b:cf:75 DHCP option: message type = DHCP ACK

00:1b:77:2b:cf:75 DHCP option: server id = 192.168.100.254
00:1b:77:2b:cf:75 DHCP option: lease time = 86400 seconds
00:1b:77:2b:cf:75 DHCP option: gateway = 192.168.100.1
00:1b:77:2b:cf:75 DHCP option: 15 (len 13) - skipping
00:1b:77:2b:cf:75 DHCP option: netmask = 255.255.255.0
00:1b:77:2b:cf:75 DHCP options end, len 312, actual 64
```

WLC ب صالح ایلخ ادل DHCP م داخل یل ع تاریجأت حسم

لـا نـم لـدان يـلخـاد لـا يـلـع رـجـأـتسـي لـا DHCـP اـذـه تـرـدـصـأ عـيـطـتـسـي تـنـأ WLC:

```
<#root>  
config dhcp clear-lease
```

لاثم یلی امیف:

```
<#root>  
config dhcp clear-lease all
```

تاریذحتل

- يلخادلا DHCP مداخ لمعيل لوكوتورب ليك ونيكمت بجي
  - رثأتب يذل او ،يلخادلا DHCP مداخ مادختسا دنع 1067 ذفنملل DHCP لوكوتورب مدخلتسا  
ةيزكرملأا ئجلاعملأا ةدحو لىا (ACL) لوصولا يف مكحتلا مئاوقب
  - 127.0.0.1 UDP ذفنم رباع مكحتلا ةدحو عاجرتسا ةهجاو لىع يلخادلا DHCP مداخ عمتسي

## يئاهنلا مدختسمل ا ٤٥ج او

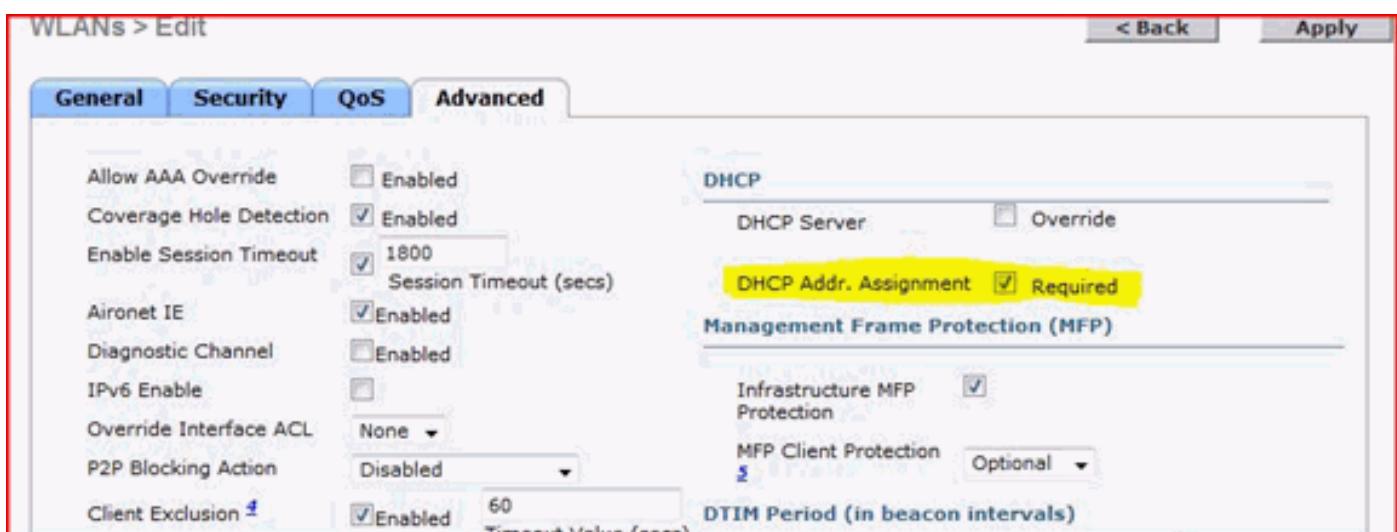
- ماء رمأ اذه DHCP طبر ئيفي ظو مادختس! رمألا نم ضتى config dhcp proxy disable رمألا ضرعى (ةيكلىسال ئيلحوم ئكبس لىكلى سىل).

- پیمانه DHCP را برای این شبکه انتخاب کنید.

- تاكبش ةطس اوب يلخادل DHCP مداخ مادختسا نكمي ال ، ليكولي طعـت متـي امـدعـيـجـوتـهـدـاعـالـةـبـولـطـمـلـاـتـايـلـمـعـلـاـعـمـلـيـصـوـتـلـاـةـيلـمـعـقـفـاوـتـالـةـيـلـحـمـلـاـWLANـلـيـوـحـتـعـانـثـتـسـابـ،ـلـيـصـوـتـلـاـاـقـحـلـيـصـوـتـلـاـيـنـعـيـلـيـصـوـتـلـاـيـلـخـادـلـاـمـداـخـلـاـىـلـاـةـمـزـحـ802.11ـلـيـلـاـLWAPPـقـفـنـنـمـلـيـدـعـتـنـوـدـDHCPـمـزـحـرـيـرـمـتـمـتـيـ2ـتـنـرـثـيـاـىـلـاـسـكـعـلـاـبـسـكـعـلـاـوـلـيـمـعـلـاـبـةـصـاخـلـاـ).
  - WLAN ةكبش يف وأ) WLAN ةهجاو ليلع DHCP مداخ نـيـوـكـتـبـجـيـ،ـلـيـكـولـاـنـيـكـمـتـدـنـعـمـدـعـلـاـرـظـنـلـيـكـولـاـلـيـطـعـتـدـنـعـمـداـخـيـأـنـيـوـكـتـمـزـلـيـالـ.ـWLANـةـكـبـشـنـيـكـمـتـلـ(ـاـهـسـفـنـمـداـخـلـاـهـذـهـمـادـخـتـسـاـ).
  - عـيـمـجـنـأـنـمـاـيـلـخـادـقـقـحـتـلـاـكـيـلـعـفـلـيـكـوـنـيـكـمـتـمـدـخـتـسـمـلـاـلـواـحـيـامـدـنـعـكـانـهـنـكـتـمـلـاـذـأـوـهـنـيـوـكـتـمـتـDHCPـمـداـخـاهـيـدـلـ(ـةـطـبـتـرـمـلـاـتـاهـجـاـوـلـاـوـأـ)ـWLANـتـاكـبـشـلـشـفـتـنـيـكـمـتـلـاـةـيـلـمـعـنـإـفـ،ـةـحـاسـمـ.

# پول طم DHCP

یل ا به ذی ن ا لب ق DHCP رمی ن ا لم عت سم بل طت ی ن ا رای خ ی قلت ی لی کش ت م دق ت م WLAN ا ذه بل طت ی .(م کح ت زاه جل ال ا لخ نم رو رم ة کح ررم عی طت سی نوب زل ا ثیح ة لود) ة لود ل ا run ه نع ثح ب بت ی ذل ا یس یئر ل ا عی شل ا .ی فصن و ا لم اک DHCP بل طب موق ی ن ا لی م عل ا نم رای خ ل ا لی م عل ا موق ی امل اط .DHCP م داخ نم ی تأی ی ذل ا ACK و DHCP بل ط و ه لی م عل ا نم م کح ت ل ا ة دح و RUN. ة لاح ی ل ا لق نی و DHCP بول طم ل ا و ظخل ا ری مر ت ب لی م عل ا موق ی ،ت او ظخل ا ه ذه ذی فن ت ب



L1، L2 و L3 اوجتلا

L2 Roam مكحـت يـتـدـحـوـنـيـبـ L2 ئـلـوجـيـوـحـلـاصـ DHCP رـاجـيـاـ هيـدـلـ لـيـمـعـلـاـ نـاـكـ اـذـاـ -  
لـاخـداـ لـقـنـ بـجـيـوـ DHCP ئـدـاعـاـ ئـلـاـ لـيـمـعـلـاـ جـاتـحـيـ الـأـ بـجـيـفـ ،ـاهـسـفـنـ L2 ئـكـبـشـ ئـلـعـ نـيـتـفـلـتـخـمـ  
لـيـمـعـلـاـ نـاـكـ اـذـاـ ،ـكـلـذـ دـعـبـ .ـةـيـلـصـأـلـاـ مـكـحـتـلـاـ ئـدـحـوـنـمـ ئـدـيـدـجـلـاـ مـكـحـتـلـاـ ئـدـحـوـنـىـلـاـ لـمـاـكـلـابـ لـيـمـعـلـاـ  
مـكـحـتـلـاـ ئـدـحـوـنـىـلـعـ لـيـكـوـلـاـ ئـيـلـمـعـلـاـ وـأـ DHCP طـبـرـ ئـيـلـمـعـنـإـفـ ،ـئـرـخـأـ ئـرـمـ DHCP ئـلـاـ ئـجـاحـبـ  
ـئـرـخـأـ ئـرـمـ ئـمـزـحـلـاـ رـيـسـكـتـبـ فـافـشـ لـكـشـبـ مـوقـتـ ئـيـلـاحـلـاـ.

L3 Roam مـكـحـتـ يـتـدـحـوـنـيـبـ لـيـمـعـلـاـ لـقـتـنـيـ ،ـثـلـاثـلـاـ ئـوـتـسـمـلـاـ نـمـ لـاـوـجـتـلـاـ ويـرـانـيـسـ يـفـ -  
مـكـحـتـلـاـ ئـدـحـوـبـ لـيـمـعـلـاـ طـبـرـمـتـيـ ،ـةـلـاحـلـاـ هـذـهـ يـفـ .ـةـفـلـتـخـمـ L3 ئـكـبـشـ يـفـ نـيـتـفـلـتـخـمـ  
ويـرـانـيـسـ ئـانـثـأـ .ـةـدـيـدـجـلـاـ ئـيـجـرـاخـلـاـ مـكـحـتـلـاـ ئـدـحـوـنـىـلـعـ لـيـمـعـلـاـ لـوـدـجـ يـفـ هـجـارـدـاـ مـتـيـوـ ئـيـلـصـأـلـاـ  
مـتـيـ ئـيـجـ عـاسـرـالـاـ مـكـحـتـ ئـدـحـوـ ئـطـسـاـوـبـ لـيـمـعـلـاـ لـوـكـوـتـوـرـبـ عـمـ لـمـاعـتـلـاـ مـتـيـ ،ـعـاسـرـالـاـ  
مـكـحـتـلـاـ تـادـحـوـوـ ئـيـبـنـجـأـلـاـ مـكـحـتـلـاـ تـادـحـوـنـيـبـ EoIP قـفـنـ لـخـادـ لـيـمـعـلـاـ تـانـاـيـبـلـ تـاـوـنـقـ ئـاشـنـاـ  
عـاسـرـالـاـ يـفـ.

## ئـلـصـ تـاـذـ تـامـوـلـعـمـ

- [لـاـثـمـ لـيـكـشـتـ لـوـصـوـلـاـ طـاقـنـ cisco Aironet نـزـوـفـيـفـخـلـ 43 رـايـخـ](#)
- [تـادـنـتـسـمـلـاـوـيـنـقـتـلـاـ معـدـلـاـ Cisco Systems](#)

## هـ لـ وـ لـ جـ رـ تـ لـ اـ هـ ذـ هـ

ةـ يـ لـ آـ لـ اـ تـ اـ يـ نـ قـ تـ لـ اـ نـ مـ مـ جـ مـ وـ عـ مـ اـ دـ خـ تـ سـ اـ بـ دـ نـ تـ سـ مـ لـ اـ اـ ذـ هـ تـ مـ جـ رـ تـ  
لـ اـ عـ لـ اـ ءـ اـ حـ نـ اـ عـ يـ مـ جـ يـ فـ نـ يـ مـ دـ خـ تـ سـ مـ لـ لـ مـ عـ دـ ئـ وـ تـ حـ مـ يـ دـ قـ تـ لـ ةـ يـ رـ شـ بـ لـ اـ وـ  
اـ مـ كـ ةـ قـ يـ قـ دـ نـ وـ كـ تـ نـ لـ ةـ يـ لـ آـ ةـ مـ جـ رـ تـ لـ ضـ فـ اـ نـ اـ ةـ ظـ حـ اـ لـ مـ ئـ جـ رـ يـ .ـ صـ اـ خـ لـ اـ مـ هـ تـ غـ لـ بـ  
يـ لـ خـ تـ .ـ فـ رـ تـ حـ مـ مـ جـ رـ تـ مـ اـ هـ دـ قـ يـ يـ تـ لـ اـ ةـ يـ فـ اـ رـ تـ حـ اـ لـ اـ ةـ مـ جـ رـ تـ لـ اـ عـ مـ لـ اـ حـ لـ اـ وـ  
ىـ لـ إـ أـ مـ ئـ اـ دـ عـ وـ جـ رـ لـ اـ بـ يـ صـ وـ تـ وـ تـ اـ مـ جـ رـ تـ لـ اـ هـ ذـ هـ ةـ قـ دـ نـ عـ اـ هـ تـ يـ لـ وـ ئـ سـ مـ  
(رـ فـ وـ تـ مـ طـ بـ اـ رـ لـ اـ)ـ يـ لـ صـ أـ لـ اـ يـ زـ يـ لـ جـ نـ إـ لـ اـ دـ نـ تـ سـ مـ لـ اـ).