

IOS XE EVPN/VXLAN في DHCP تتركش

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قمدقمل

كيشل (DHCP) فيضم لل يكيما نيدل نيوكتل لوكتورب نيوكت دنتسمل اذه فصي، قفلتخم تاهويرانيس في (VXLAN) قيره اطلال قسومل LAN كيش Ethernet VPN (EVPN)، DHCP Win2016 و Win2012 مداوخل قددحم بناوحو.

قيساسأل تابلطتم

تابلطتم

DHCP و EVPN/VXLAN نم قفرعم تنأ يقلت نأ ي صوي cisco.

قمدختسمل تانوكمل

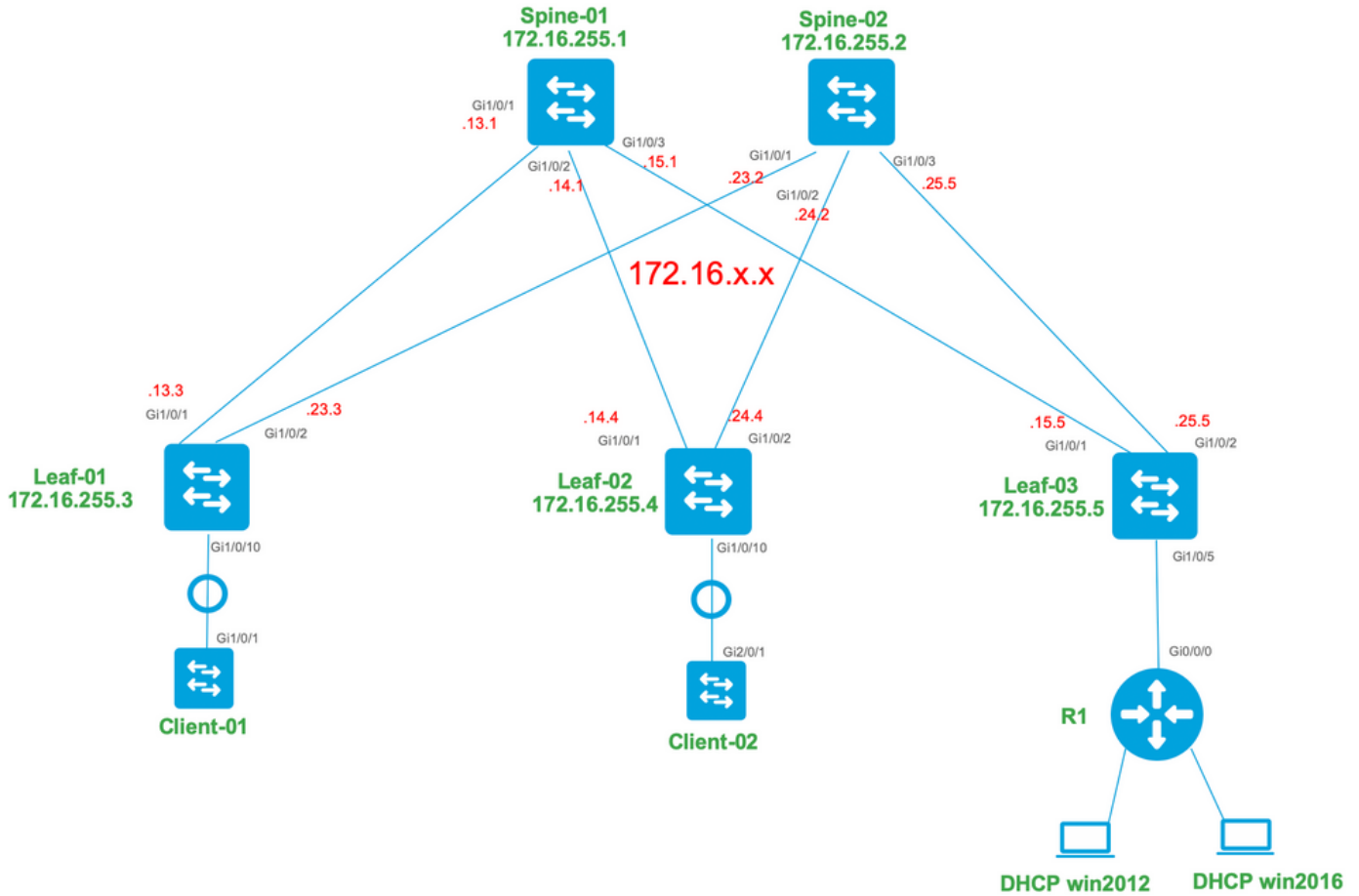
قيلال قيدامل تانوكمل او حماربل تارادصل ل دنتسمل اذه في قراول تامولعمل دنتست:

- C9300
- C9400
- C9500
- C9600
- MSFT نم Win2012 R2 ل ي غشتل ماظن
- MSFT Windows Server 2016 ل ي غشتل ماظن

• شحأ رادصا وا Cisco IOS XE 16.9.x ىلع ةرفوتملا تازيما
 ةصاخ ةيلعم ةئيب يف ةدوجوملا ةزهجالا نم دنتسملا اذه يف ةدراولما تامولعملما عاشنإ مت
 تناك اذا. (يضا رتفا) حوسمم نيوكتب دنتسملا اذه يف ةمدختسملا ةزهجالا عيمج تادب
 رما يال لم تحملا ريثاتلل كمهف نم دكأتف ، ليغشتلا دي قكتك بش

نيوكتلا

ةكبشلل يطيختلا مسرلا

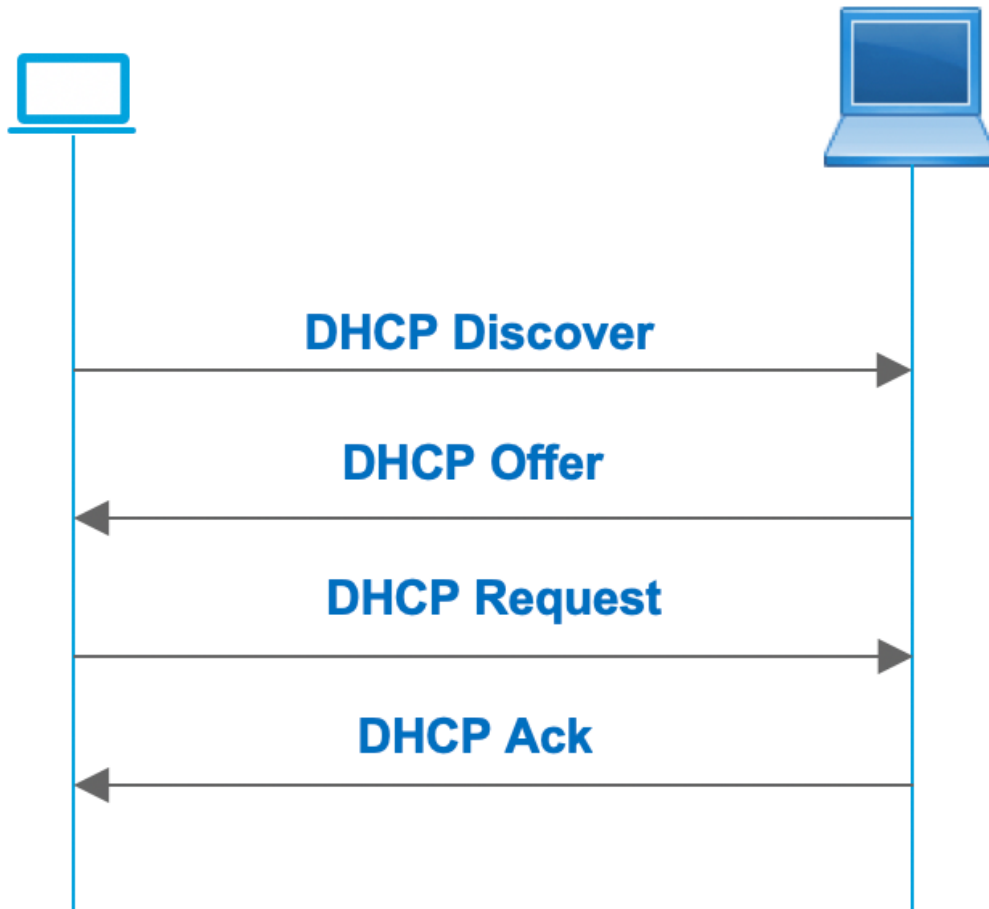


تانيوكتلا

لحارم عبرا كانه .مداخل او DHCP ليمع نيبة لاسرلا قفدت عجارن انعد ، نالا

DHCP client

DHCP server



عمو، اهسفن ةيعرفلا ةكبشلا يف مداخل او ليمعلا اهي ف نوكي يتلا تالاحل ايف لمعي اذهو ةيعرفلا ةكبشلا يف DHCP مداخل نوكي ال، تالاحل مطعم يف . لالاحل وه اذه نوكي ال، ةداع، كلذ لباقم 3 ةقبطلا نم هجوم راسم ربع هيل لوصول لباق نوكي نأ بجي وليمعلا عم اهسفن DHCP ليجرت ةزيم لوجت . DHCP ليجرت ةفيظو رفوت مزلي، ةالاحل هذه يف 2. ةقبطلا هلاسراو هيجوت لل لباق نوكي يذلاو UDP ل فلغملا يداخل ال ثبلا ال ثبلا (هجوملا و لوجملا) مالا هذه تاكبشلا يف عساو لكشب مدختسم نيوكت وهو . DHCP مداخل ال

DHCP و EVPN/VXLAN: ةينب عم تايدحت

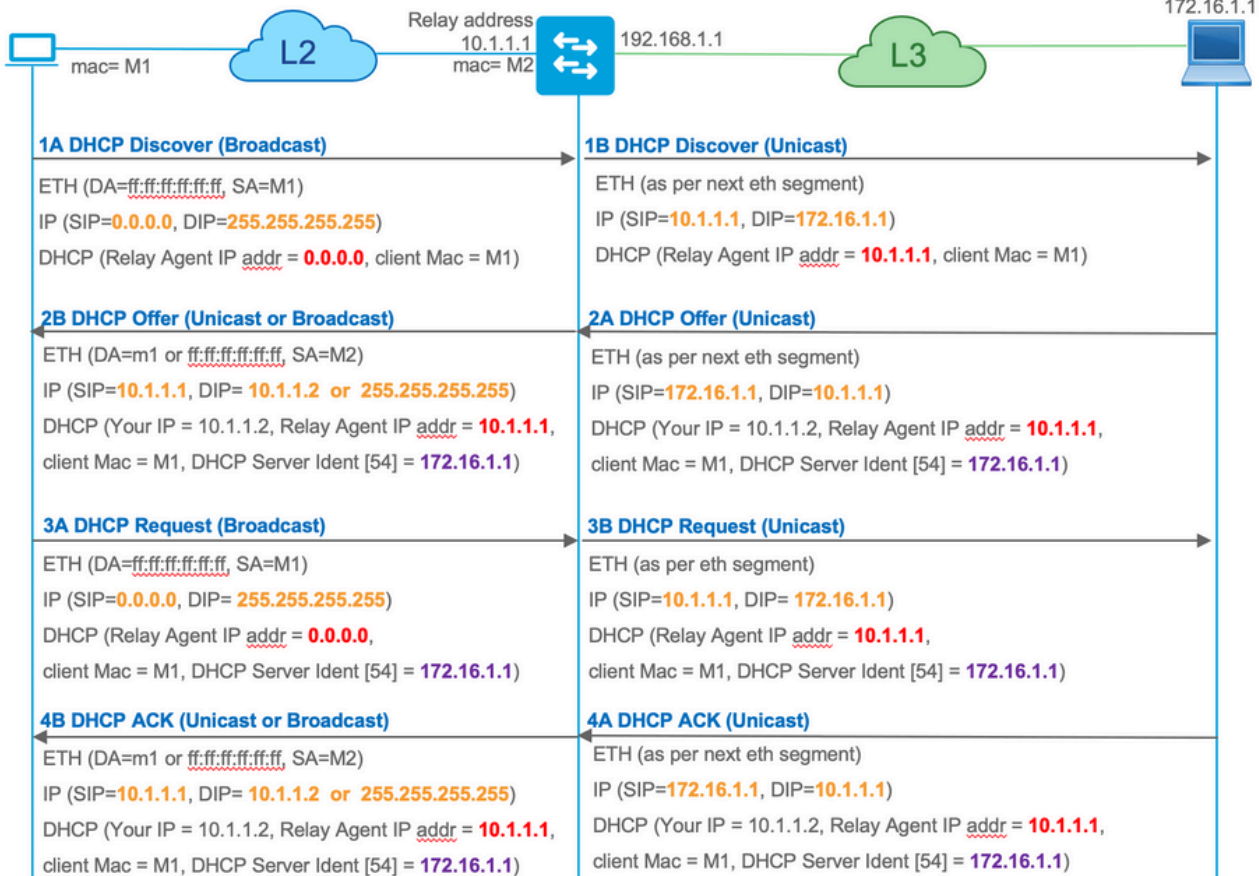
كيلع بجي هنا ينعي اذه . L3 ةكبش ربع EVPN جيسنب DHCP مداخل ليصوت متي، ةداع ةيداح هيجوت ةمزح ال 2 ةقبطلل DHCP ثب ةمزح ليجوتل DHCP ليجرت ةفيظو مادختسا 3. ةقبطلل ثبلا

مداخل او ليجرت او ليمعلا ني ب DHCP تاملكم قفدت لمعي، DHCP ليجرت ةزيم مادختساب ل لثامم لكشب

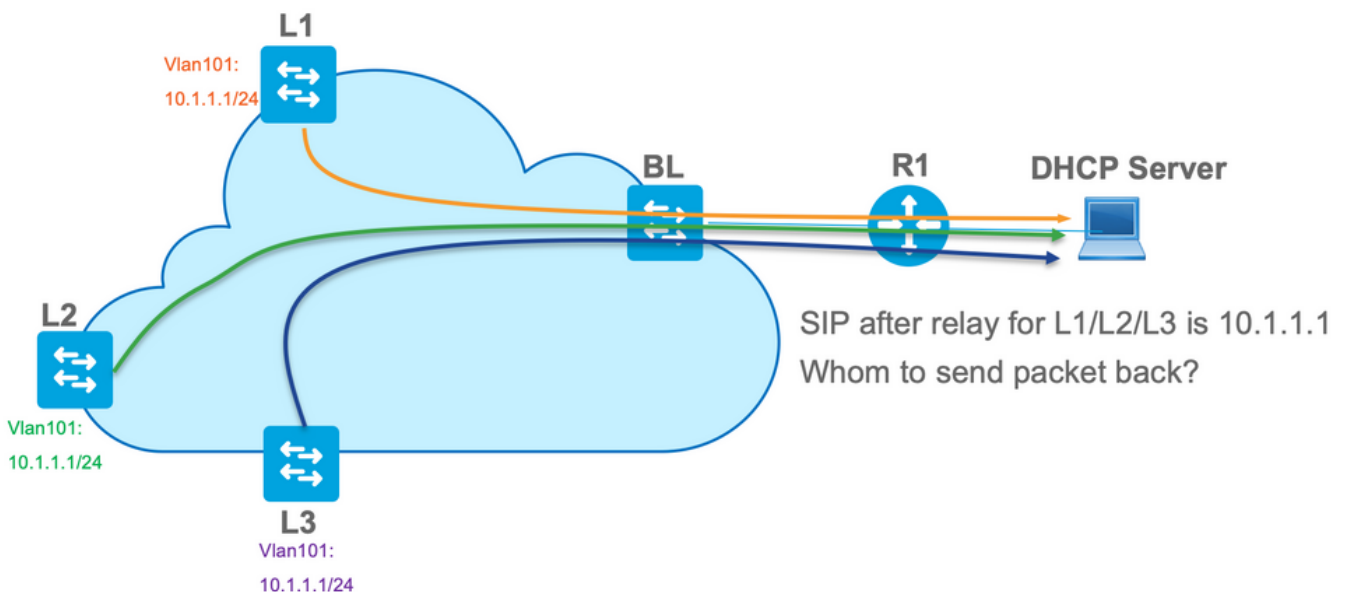
DHCP client

DHCP relay

DHCP server



في فة لكشم اذه قلخي ،امهم .ليحرتلل IP وه ةمزلل ردصملا IP نوكي ،هيجوتلا ةداعإ دعب AnyCast عزوم لامعتسإلاب بسبب ديرف سي ل IP داتعملل ردصملا نأ امب رشن VXLAN/EVPN ببستي نأ نكمي كلذ نإف ،اهسفن يه ردصملا VTEP SVI تالوكوتورب عي مج نأل . GW (DAG). ةقرو برقأ ىلإ DHCP مداخ نم درلا مزح هيجوت ةداعإ في



مزل ديرف IP ناو نع مادختسا ىل ع ارداق نوكت نأ بجي ،ةديرفال ريغ ردصملا ةلكشم ل حل DHCP مداخ ىل ع GIADDR لادبتسا ب قلعتت ىرخأ ةلاسمةم ةقرو ل كل ةلوقنملا DHCP ، ي طغي يذلاو ،عمجتلا نم كلذ متي . IP ناو نع نيي عتل حيحصلال عمجتلا رايتخا كي لع بجي دعب نأ ريغ ، SVI نم IP ناو نع نوكي نأ يغبني وه ،ءانب EVPN ل . (giaddr) ةرابعلل IP ناو نع

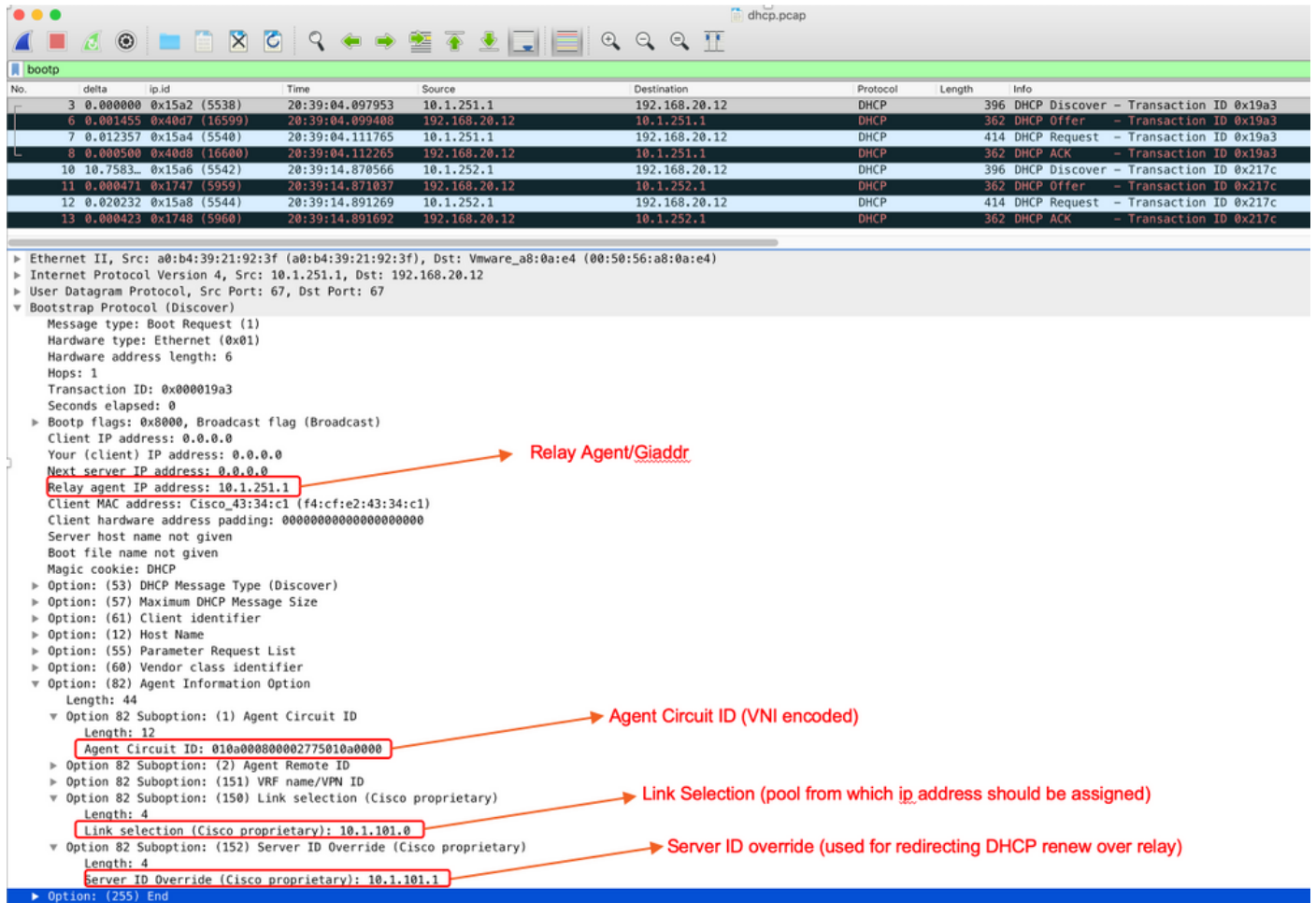
ديرف عاجرتسا إلاجال هذه في نوكي يا ناونع ليحرت ب giaddr ل تلدبتسا، ليحرتال

مه ادختسا بجي يتل تاومجملاب، DHCP مداخل كنكمي فيك

في عرفال تارايلخا يه هذه، ياساس ل كشبو. 82 رايلخ تلمعتسا، رادصا اذه تللح in order to
 اهمهالم:

- لقن ب في عرفال رايلخال اذه موقوي، VXLAN/EVPN ةكبش ةلاحي في. ليكولا ةرئاد فرعم - 1
 فرعم VNI
- لعل يوتحت يتل طابترال ديحت في عرفال تارايلخا. (ةصاخال Cisco ةكرشل 150 وأ) - 5
 DHCP ةمزحاهنم تقلطنان يتلاو، ةيلعل في عرف ةكبش
- لعل يوتحتي يذلا مداخل فرعم زواجت في عرفال رايلخا. (ةصاخال Cisco ةكرشل 152 وأ) - 11
 DHCP مداخل ناونع
- VPN فرعم/ VRF مسا لعل في عرفال رايلخال اذه يوتحتي. VPN فرعم/ VRF مسا - 151

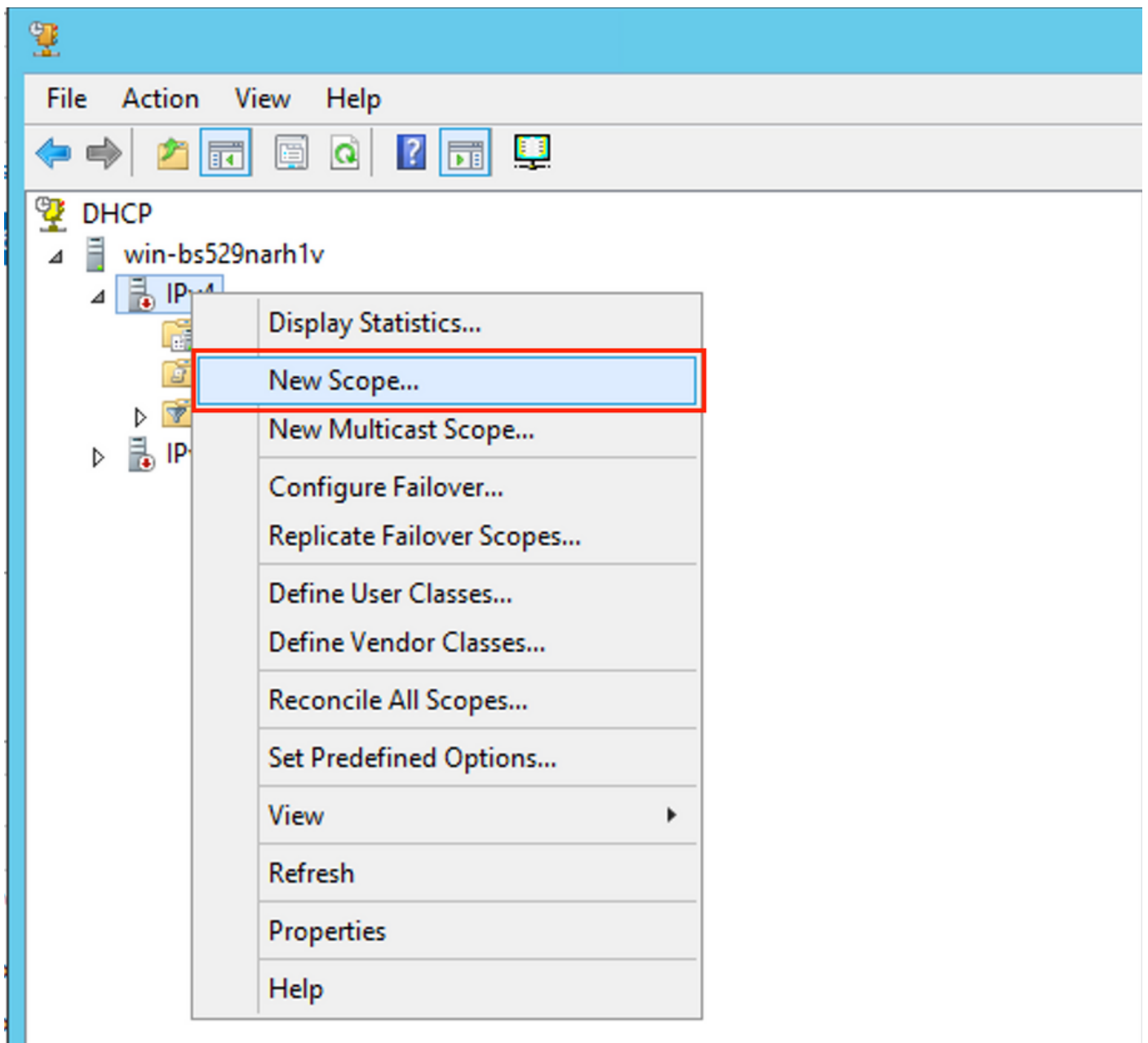
تارايلخا هذه في وركنكمي، DHCP مداخل لي DHCP ليحرت نم طبرل نم طاقتل ةمزح في
 ةروصل في حضورم وه امك DHCP ةمزح في ةدوجومال ةفلتخالم.



لوجمل نيوك:

- DHCP عمجت رايتخال ةي رورضال ةي رورضال تامولعمل لك لعل 82 رايلخا يوتحتي
 ةححصال ةحفضال ل مداخل نم ةمزحل عاجراوحيحصال.
- لك معد مدع مغر، 82 رايلخا تامولعمل ةجالعم عي طتسي DHCP مداخل ناك اذا طقف اذه لمعي
 لم كلاب هل مداخل (WIN2012 R2 لثم).

ip dhcp relay information option vpn <<< adds the VRF name/VPN ID to the option 82



ةروضلا يف حضوم وه امك يلاتلا ددح.

New Scope Wizard



Welcome to the New Scope Wizard

This wizard helps you set up a scope for distributing IP addresses to computers on your network.

To continue, click Next.

< Back

Next >

Cancel

ةروصللا يف حضورم وه امك يلاتلا ددح مئ ،فصو ،ينعم و ذ مسا ةئبعتب مق

New Scope Wizard

Scope Name

You have to provide an identifying scope name. You also have the option of providing a description.



Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

< Back

Next >

Cancel

نكلو 24/ وه ةكبشلا عانق نوكي، لاثملا اذه يف . لىحرتلا عمجتلا IP ناوئع تامولعم ألم ا ةروصللا يف حضورم وه امك (ةكبشلا مچح ىلع دمتعي) رغصأ وأ ربكأ نوكي نا نكمي

New Scope Wizard

IP Address Range

You define the scope address range by identifying a set of consecutive IP addresses.



Configuration settings for DHCP Server

Enter the range of addresses that the scope distributes.

Start IP address:

End IP address:

Configuration settings that propagate to DHCP Client

Length:

Subnet mask:

< Back

Next >

Cancel

عمجتلا اذه نم IP نيوانع صي صخت نكمي، ال او، مهم اذه . عمجتلا نم تاقاطنلا ةفاك ءانثتسا

New Scope Wizard

Add Exclusions and Delay

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.



Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address:

End IP address:

Add

Excluded address range:

10.1.251.1 to 10.1.251.254

Remove

Subnet delay in milli second:

< Back

Next >

Cancel

ةروصل لاي ف حضم وه امك (ماي 8 نوكي ايسارتفا) رجاتل تقو نيوك تب مق

New Scope Wizard

Lease Duration

The lease duration specifies how long a client can use an IP address from this scope.



Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

Limited to:

Days: Hours: Minutes:

< Back

Next >

Cancel

(لا تملأ اذه ي ف هي طخت مت) DNS/WINS لثم DHCP را يخ تام لعم ني وكت كنكم ي.

New Scope Wizard

Configure DHCP Options

You have to configure the most common DHCP options before clients can use the scope.



When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

- Yes, I want to configure these options now
- No, I will configure these options later

< Back

Next >

Cancel

ةروصل لاي ف حضورم وه امك قاطنلا طيشنتب مق

New Scope Wizard

Activate Scope

Clients can obtain address leases only if a scope is activated.



Do you want to activate this scope now?

- Yes, I want to activate this scope now
- No, I will activate this scope later

< Back

Next >

Cancel

ةروصلال ي ف حضوم وه امك ن ي وكتال اءان اب مق

New Scope Wizard



Completing the New Scope Wizard

You have successfully completed the New Scope wizard.

To provide high availability for this scope, configure failover for the newly added scope by right clicking on the scope and clicking on configure failover.

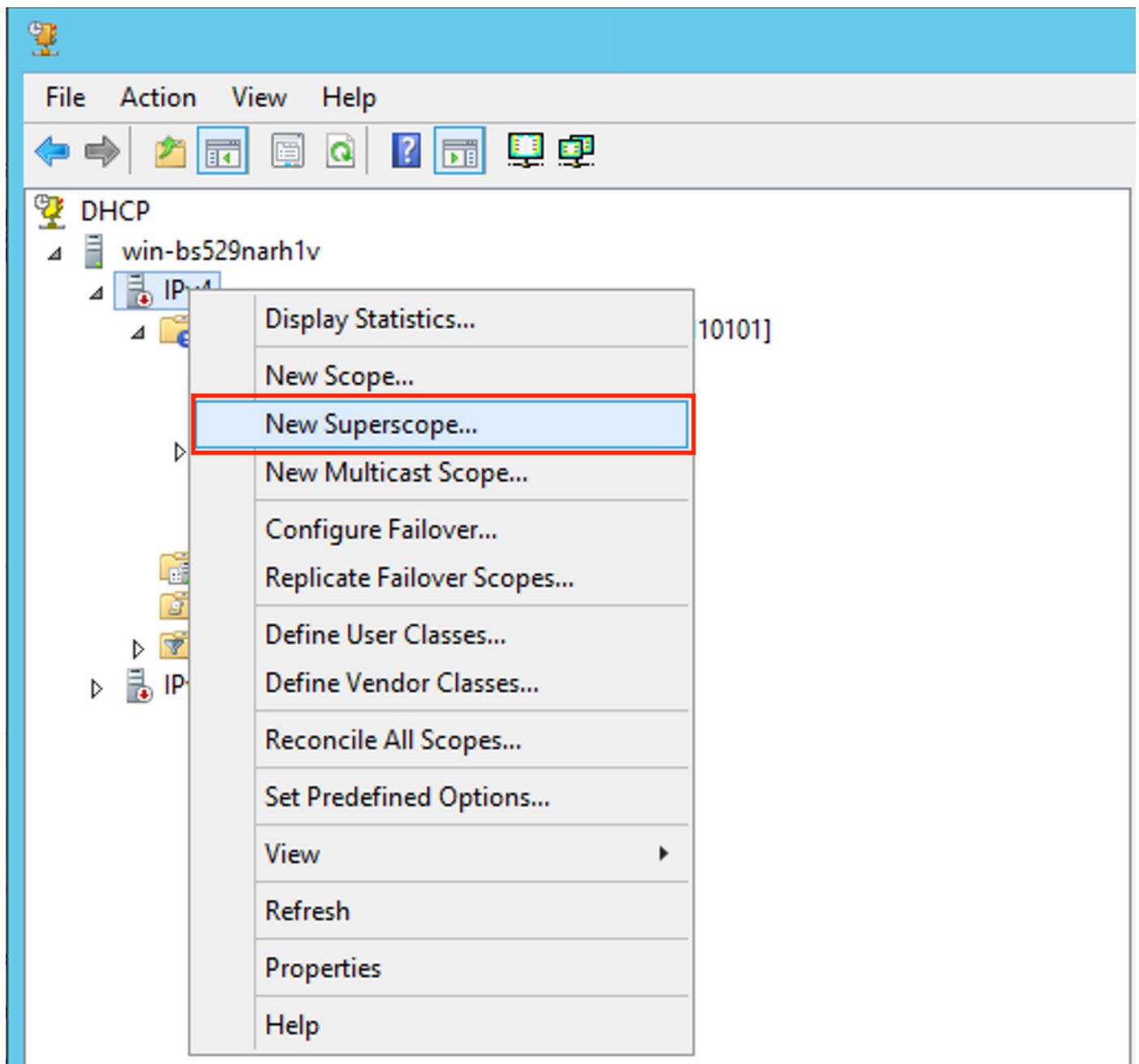
To close this wizard, click Finish.

< Back

Finish

Cancel

وه امك دي دجل ع فترم لارتخاو نمي الالس وامل رزب دي دحت ل اب مق .ة جرد يلعأ عاش ن اب مق ن الة
ة روص ل ا ي ف ح ض وم .



ةروضلا يف حضوم وه امك يلاتلا ددح

New Superscope Wizard



Welcome to the New Superscope Wizard

This wizard helps you create a superscope, which expands the number of IP network addresses that you can use in a network.

A superscope allows several distinct scopes to be logically grouped under a single name.

To continue, click Next.

< Back

Next >

Cancel

ةروصل لى ف حضورم وه امك لى لاعل راطن ملل ى نعم و ذ م سا رتخأ.

New Superscope Wizard

Superscope Name

You have to provide an identifying superscope name.



Name:

< Back

Next >

Cancel

قائفا قاطنلا ىل هتفاض ا دېرت يذلا قاطنلا رتخأ.

New Superscope Wizard

Select Scopes

You create a superscope by building a collection of scopes.



Select one or more scopes from the list to add to the superscope.

Available scopes:

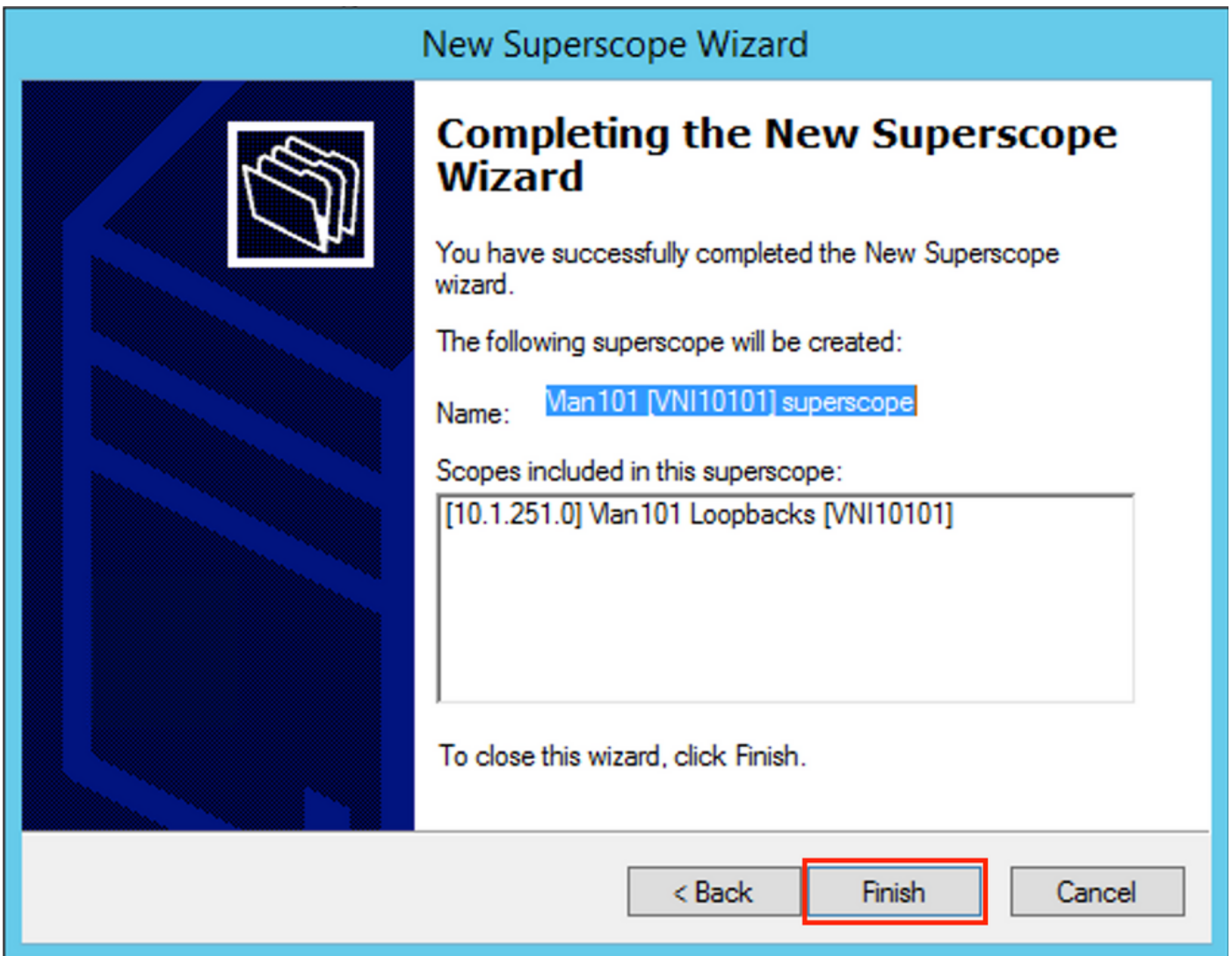
[10.1.251.0] Man101 Loopbacks [VNI10101]

< Back

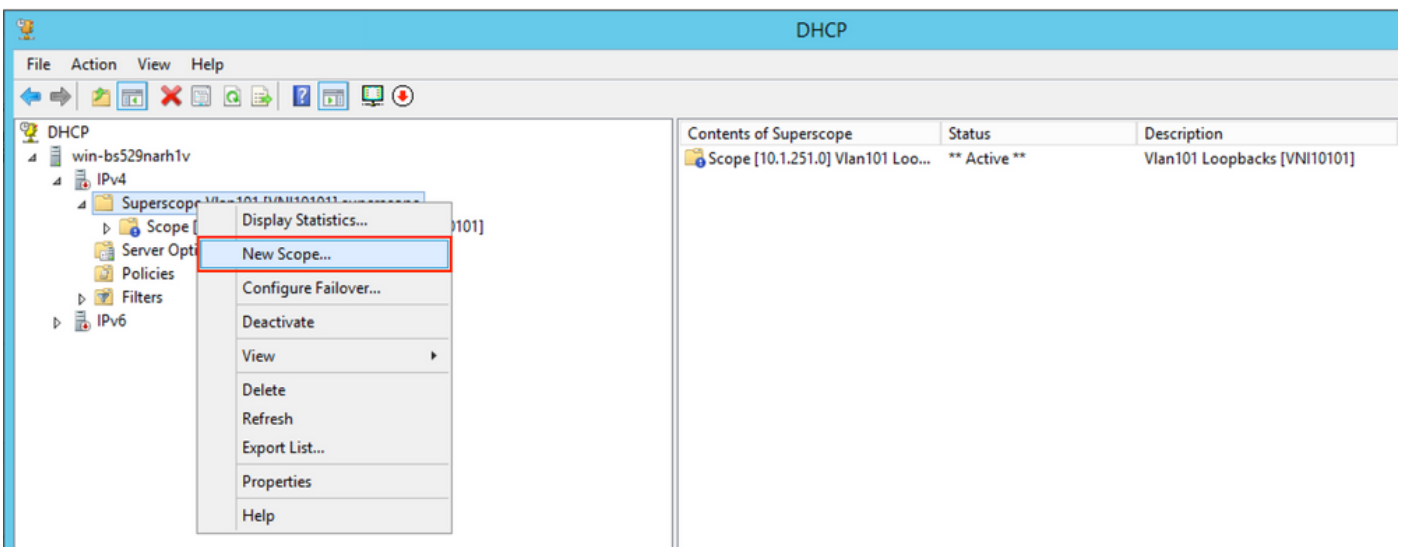
Next >

Cancel

ةروضلا يف حضوم وه امك دادعإلا ءاهنإب مق



ددحو نميأل سوامل رزب رقنا IP. نيوانع صي صيخت هل لالخ نم م تي DHCP عمجت عاشن اب مق ةروصلال ي ف حضورم وه امك ... اد يدج اق اطن



ةروصلال ي ف حضورم وه امك ي لال ا دح

New Scope Wizard



Welcome to the New Scope Wizard

This wizard helps you set up a scope for distributing IP addresses to computers on your network.

To continue, click Next.

< Back

Next >

Cancel

ةروصلالاي فحضم وه امك فصوصو ىنعم و ذم سا رتخأ

New Scope Wizard

Scope Name

You have to provide an identifying scope name. You also have the option of providing a description.



Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

< Back

Next >

Cancel

يف حضورم وه امك عالم عمل ل هل IP نيوانع صي صخت دي رت يذلا عمحت لل عانق ل او ةك ب ش ل ا ددح ةروص ل ل ا.

New Scope Wizard

IP Address Range

You define the scope address range by identifying a set of consecutive IP addresses.



Configuration settings for DHCP Server

Enter the range of addresses that the scope distributes.

Start IP address:

End IP address:

Configuration settings that propagate to DHCP Client

Length:

Subnet mask:

< Back

Next >

Cancel

حضوره وه امك (10.1.101.1 وه لاثم اذه في) ةكربلا نم لخدم ريصقتلا نم ناوعلا تي نثتسا ةروصلا في.

New Scope Wizard

Add Exclusions and Delay

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.



Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address:

End IP address:

Add

Excluded address range:

Address 10.1.101.1

Remove

< Back

Next >

Cancel

ةروصلال يف حضوم وه امك ريجأتال تقؤم ددح.

New Scope Wizard

Lease Duration

The lease duration specifies how long a client can use an IP address from this scope.



Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

Limited to:

Days: Hours: Minutes:

< Back

Next >

Cancel

(لا تشمل اذنه في هيطخت مت) DNS/WINS ديحت ايراي تخ | كنكمي

New Scope Wizard

Configure DHCP Options

You have to configure the most common DHCP options before clients can use the scope.



When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

- Yes, I want to configure these options now
- No, I will configure these options later

< Back

Next >

Cancel

ةروصلال ي ف حضوم وه امك نيوكتال ءاهناب مق

New Scope Wizard



Completing the New Scope Wizard

You have successfully completed the New Scope wizard.

Before clients can receive addresses you need to do the following:

1. Add any scope specific options (optional).
2. Activate the scope.

To provide high availability for this scope, configure failover for the newly added scope by right clicking on the scope and clicking on configure failover.

To close this wizard, click Finish.

< Back

Finish

Cancel

عمجت ل ل ة سايس ءاشن ا بجي ، عمجت ل ءاشن ا دع ب

- قباطم [1] جهن ل ل ل ءو ة رءاء فرعم ي ف
- ل ءحرت ل subpool عم ءكرب ربوس قلخي ن ا رطاضي تن ا VLANs/VNIs ة دع تن ا ي ق ل تي ن ا
- ل كل ص ي ص خ تل ي دم IP ي ق ي ق ح ل او ن ا ونع
- 10101 و 10102 VNIs ل ا ثم اذه ل م ع ت سي

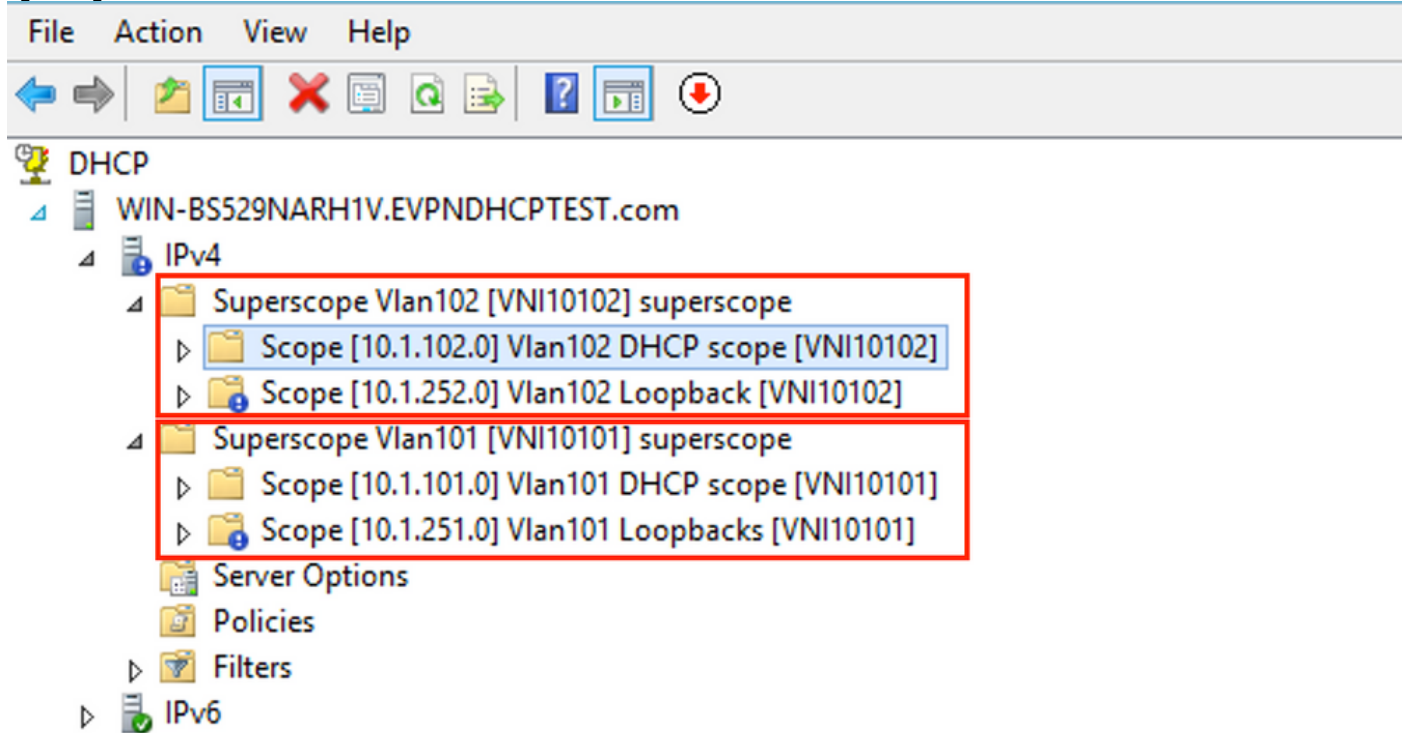
ل و ح م ل ا ن ي و ك ت

```
ip dhcp relay information option vpn <<< add the VRF name/VPN ID to the option 82
ip dhcp relay information option <<< enables option 82
!
ip dhcp snooping vlan 101-102,201-202
ip dhcp snooping
!
vlan configuration 101
member evpn-instance 101 vni 10101
!
interface Loopback101
 vrf forwarding green
 ip address 10.1.251.1 255.255.255.255
!
interface Loopback102
 vrf forwarding green
 ip address 10.1.251.2 255.255.255.255
```

```

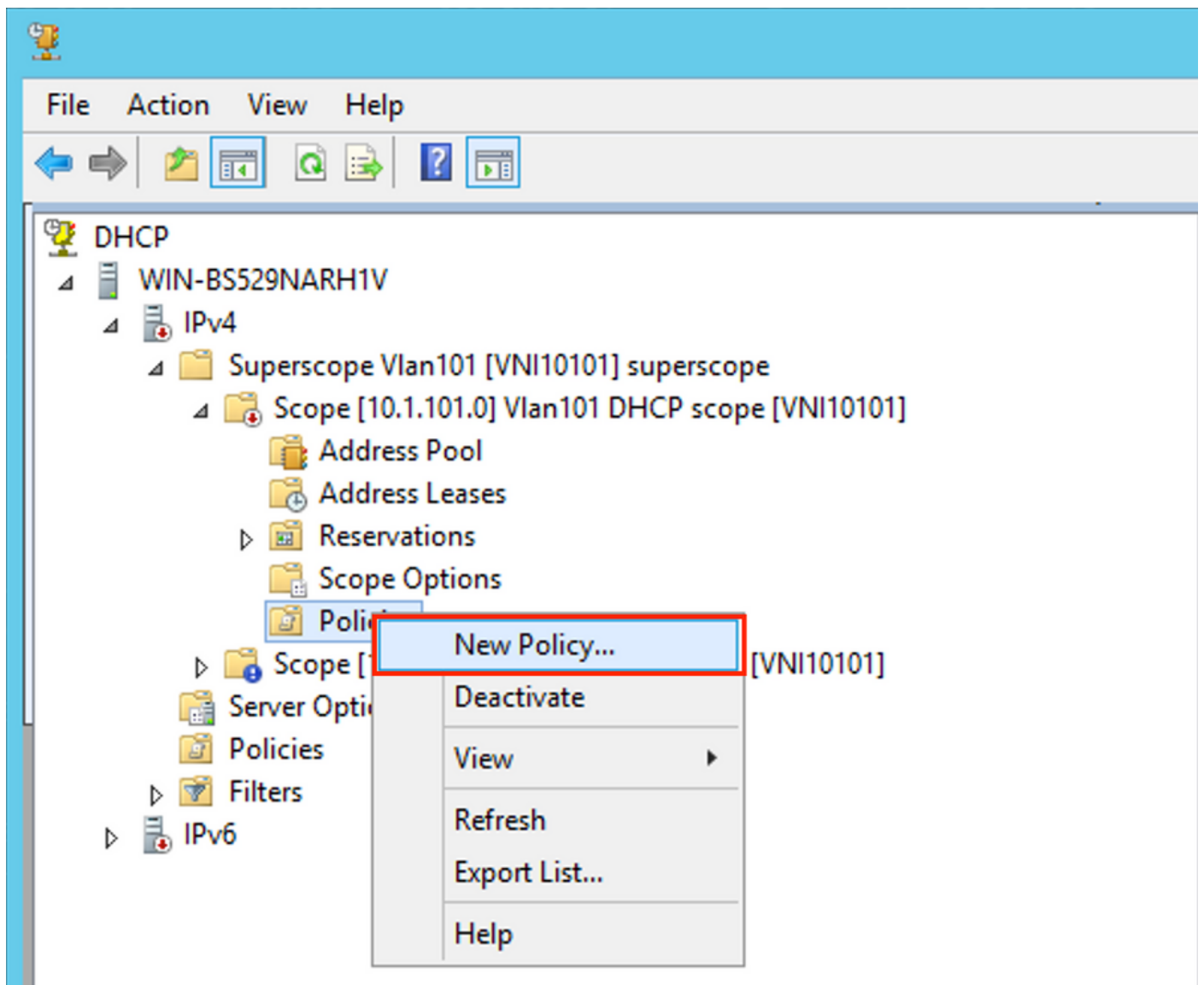
!
interface Vlan101
 vrf forwarding green
 ip dhcp relay source-interface Loopback101 <<< DHCP relay source is unique Loopback101
 ip address 10.1.101.1 255.255.255.0
 ip helper-address 192.168.20.12 <<< 192.168.20.12 - DHCP server
!
interface Vlan102
 vrf forwarding green
 ip dhcp relay source-interface Loopback102 <<< DHCP relay source is unique Loopback102
 ip address 10.1.101.1 255.255.255.0
 ip helper-address 192.168.20.12 <<< 192.168.20.12 - DHCP server

```



ليكول ةرئاد فرعم لقح ةقباطم - WIN2012 R2 2 نيوكتلا راڤخ

- كلذل، ةديرفال عاجرتسالال ةزيمل يلعال مادختسالال يف لثمتتف ريخال جهنال بوي ع امأ ليكول ةرئاد فرعم لقح ةقباطم يف رخا راڤخ لثمتي.
- لى دننسي ال قاطنلا ديحتل جهن عاشن ةفاضا كنكمي نكلو، اهسفن يه تاوطلال ليحرتال IP نم ال دب ليكول ةرئاد فرعم لقح يف حضوم وه امك ديح جهن ددحو عمجتال قوف نميال سواملا رزب رقنا. تاسايسال عضو ةروصلال.



ةروصلال ي ف حضورم وه امك جه نلل ف صوو ى نعم وذ م سا رتخأ.

DHCP Policy Configuration Wizard

Policy based IP Address and Option Assignment



This feature allows you to distribute configurable settings (IP address, DHCP options) to clients based on certain conditions (e.g. vendor class, user class, MAC address, etc.).

This wizard will guide you setting up a new policy. Provide a name (e.g. VoIP Phone Configuration Policy) and description (e.g. NTP Server option for VoIP Phones) for your policy.

Policy Name:

Description:

< Back

Next >

Cancel


ةروصلال ي ف حضورم وه امك دي دجالا طرشلال ةفاضاب مق

DHCP Policy Configuration Wizard

Configure Conditions for the policy



A policy consists of one or more conditions and a set of configuration settings (options, IP Address) that are distributed to the client. The DHCP server delivers these specific settings to clients that match these conditions.

 A policy with conditions based on fully qualified domain name can have configuration settings for DNS but not for options or IP address ranges.

Conditions	Operator	Value
------------	----------	-------

AND

OR

Add...

Edit...

Remove

< Back

Next >

Cancel

ةوصوللا يف حضوم وه امك (*) لدب فرح ةفاضل ع برم سنن ت ال) بسانملا ةرئادللا فرعم لخدأ

DHCP Policy Configuration Wizard

Add/Edit Condition ? X

Specify a condition for the policy being configured. Select a criteria, operator and values for the condition.

Criteria:

Operator:

Value (in hex)

Relay Agent Information:

Agent Circuit ID:

Agent Remote ID:

Subscriber ID:

Prefix wildcard(*)

Append wildcard(*)

مقرلا اذه رايتخ| ب بس لوح حوضوت

نوكي يا 010a000800002775010a000، id ةرئاد ليكوت يار عيطتسي تنأ Wireshark ي ف
 ل VNI 10101 ل كشي ل اواسم نوكي (00002775 hex = 10101 decimal) نم ةقتشم ةمي ق اذه
 VLAN 101).

- ▼ Option: (82) Agent Information Option
 - Length: 44
 - ▼ Option 82 Suboption: (1) Agent Circuit ID
 - Length: 12
 - Agent Circuit ID: 010a000800002775010a0000
 - ▶ Option 82 Suboption: (2) Agent Remote ID
 - ▶ Option 82 Suboption: (151) VRF name/VPN ID
 - ▼ Option 82 Suboption: (150) Link selection (Cisco proprietary)
 - Length: 4
 - Link selection (Cisco proprietary): 10.1.101.0
 - ▼ Option 82 Suboption: (152) Server ID Override (Cisco proprietary)
 - Length: 4
 - Server ID Override (Cisco proprietary): 10.1.101.1

VXLAN VN: ل قيسننتلا اذبه لليكولا ةرئاد فرعمل يعرفلا راixel ريفشت مت


ذفنملا	mod	VNI	لوط	ةرئادلا فرعم عون	لوط	يعرفلا راixel عون
تياپ 2	تياپ 2	تياپ 4	تياپ 1	تياپ 1	تياپ 1	تياپ 1
*	*	00002775	08	00	0a	01

DHCP Policy Configuration Wizard

Configure Conditions for the policy



A policy consists of one or more conditions and a set of configuration settings (options, IP Address) that are distributed to the client. The DHCP server delivers these specific settings to clients that match these conditions.

 A policy with conditions based on fully qualified domain name can have configuration settings for DNS but not for options or IP address ranges.

Conditions	Operator	Value
Relay Agent Information - A...	Equals	010A000800002775*

AND

OR

Add...

Edit...

Remove

< Back

Next >

Cancel

نك مې ال، نېوكتلا اذه نودب. هـم IP نېوانع صېصخت مې يذال IP قاطن نېوكتب مق
يـلـالـ قاطنـالـ صـيـصـختـ

DHCP Policy Configuration Wizard

Configure settings for the policy

If the conditions specified in the policy match a client request, the settings will be applied.



A scope can be subdivided into multiple IP address ranges. Clients that match the conditions defined in a policy will be issued an IP Address from the specified range.

Configure the start and end IP address for the range. The start and end IP addresses for the range must be within the start and end IP addresses of the scope.

The current scope IP address range is 10.1.101.1 - 10.1.101.254

If an IP address range is not configured for the policy, policy clients will be issued an IP address from the scope range.

Do you want to configure an IP address range for the policy:

Yes

No

Start IP address: 10 . 1 . 101 . 1

End IP address: 10 . 1 . 101 . 254

Percentage of IP address range: 100.0

< Back

Next >

Cancel

ةروصولا يف حضوم وه امك ةلحرمل هذه يف ةيسايقلا DHCP تارايف ديحت اضيأ كنكمي

DHCP Policy Configuration Wizard

Configure settings for the policy

If the conditions specified in the policy match a client request, the settings will be applied.



Vendor class:

DHCP Standard Options

Available Options	Description	
<input type="checkbox"/> 002 Time Offset	UTC offset in seconds	^
<input type="checkbox"/> 003 Router	Array of router addresses order	
<input type="checkbox"/> 004 Time Server	Array of time server addresses	∨

Data entry

Long:

0x0

< Back

Next >

Cancel

ةروصل ايف حضورم وه امك ءاهن| ددح

DHCP Policy Configuration Wizard

Summary



A new policy will be created with the following properties. To configure DNS settings, view properties of the policy and click the DNS tab.

Name: Man101 [VNI10101] Option 82

Description: Man101 [VNI10101] Option 82

Conditions: OR of

Conditions	Operator	Value
Relay Agent Information - A...	Equals	010A000800002775*

Settings:

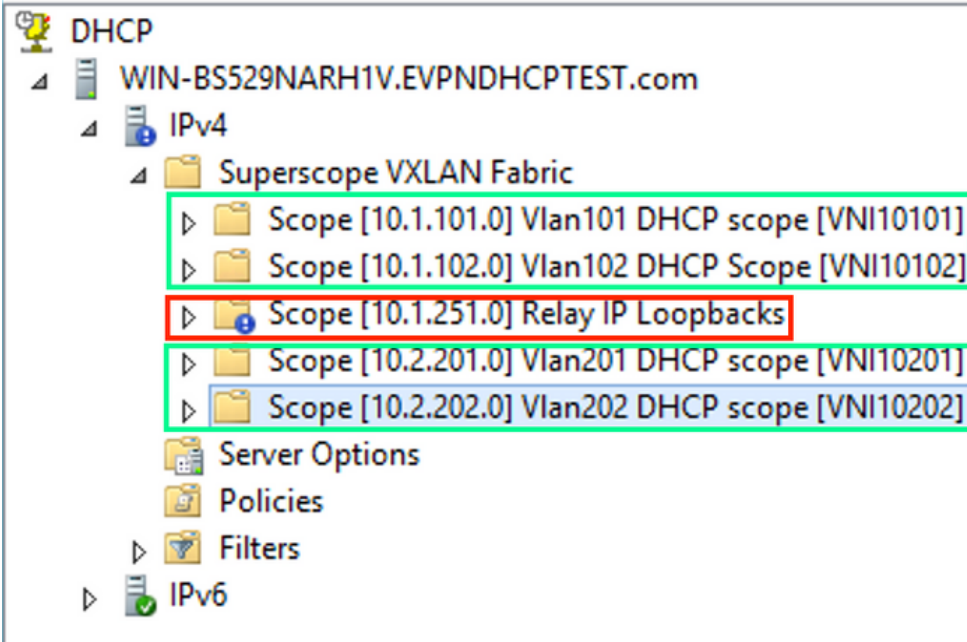
Option Name	Vendor Class	Value
-------------	--------------	-------

< Back

Finish

Cancel

ةروصل ايف حضورم وه امك ىرأالا تاقاطنلل لثامم نىوكت اارجا بجي.



سيو، SVIs ماقرأل VTEP ل كل طقف دحاو ديرف IP ناو نع مادختسا كنكمي، ويرانيسلا اذه في VTEP. ل كل VNI/SVI ل كل ديرف دحاو عاجرتسا

لوحمل نيوكت:

```
ip dhcp relay information option vpn <<< adds the VRF name/VPN ID to the option 82
ip dhcp relay information option <<< enables option 82
!
ip dhcp snooping vlan 101-102,201-202
ip dhcp snooping
!
vlan configuration 101
member evpn-instance 101 vni 10101
!
interface Loopback101
vrf forwarding green
ip address 10.1.251.1 255.255.255.255
!
interface Vlan101
vrf forwarding green
ip dhcp relay source-interface Loopback101 <<< DHCP relay source
ip address 10.1.101.1 255.255.255.0
ip helper-address 192.168.20.12 <<< 192.168.20.12 - DHCP server
!
interface Vlan102
vrf forwarding green
ip dhcp relay source-interface Loopback101 <<< DHCP relay source
ip address 10.1.101.1 255.255.255.0
ip helper-address 192.168.20.12 <<< 192.168.20.12 - DHCP server
```

Windows Server 2016 نيوكت

- ديدحت " (Cisco Private 150) 5 ةي عرفل تارايلال 82 رايلال Windows Server 2016 م عدي نم ال دبو. ةومحمل ديدحتل ديرف ليحرت IP ناو نع مدختست ال كنأ ينعي يذلا "طابت رالا لكش ب نيوكتل طس بي يذلا "طابت رالا ديدحت" ي عرفل رايلال مادختسا متي، لك لذ ريبك.
- ال DHCP ةمزح نإ ال او ليحرتل ل IP نيوانعل عمجت دع ب كي دل ناك اذ ل لصف ال نم نوكتس اهتجال عام مت الو قاطن يا قباطت.

"طابت رالا دي دحت" راڤخ مادختسا لاثم لاذه حضوي.

ةروصلال ي ف حضوم وه امك لي حرت لل IP نيوانعل IP نيوانع عمجت ادبا.

DHCP

File Action View Help



DHCP

WIN-IC90QQIUTE8.EVPNDHCPTTEST2016.com

IP v4

- Display Statistics...
- New Scope...**
- New Multicast Scope...

- Configure Failover...
- Replicate Failover Scopes...

- Define User Classes...
- Define Vendor Classes...

- Reconcile All Scopes...

- Set Predefined Options...

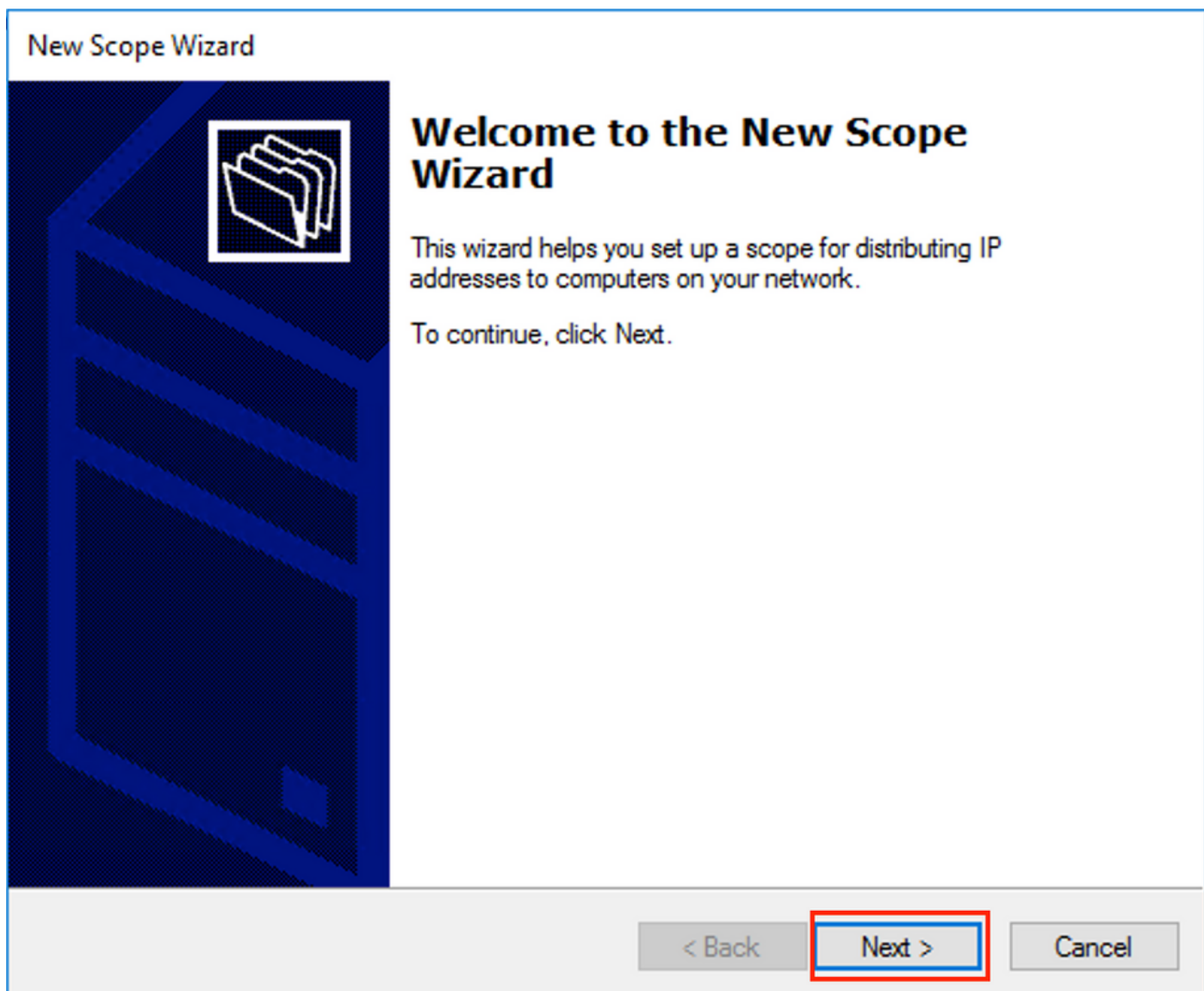
- View >

- Refresh

- Properties

- Help

ةروصللا يف حضوم وه امك ڤلاتلا ددح.



ةروصللا يف حضوم وه امك قاطنلل ىنعم وذ فصوصو مسارتخأ

New Scope Wizard

Scope Name

You have to provide an identifying scope name. You also have the option of providing a description.



Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

ةروصل لاي ف حضورم وه امك IP ليحرتل اهم ادخاستسا متي يتي ال IP ناونع ةحاسم لخداً

New Scope Wizard

IP Address Range

You define the scope address range by identifying a set of consecutive IP addresses.



Configuration settings for DHCP Server

Enter the range of addresses that the scope distributes.

Start IP address:

End IP address:

Configuration settings that propagate to DHCP Client

Length:

Subnet mask:

< Back

Next >

Cancel

في حضوره وه امك قاطنلا اذه نم صر صرحتلا عنم ل قاطنلا نم تاقاطنلا ةفاك ءانثتسا ةروصللا.

New Scope Wizard

Add Exclusions and Delay

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.



Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address:

End IP address:

Add

Excluded address range:

10.1.251.1 to 10.1.251.254

Remove

Subnet delay in milli second:

< Back

Next >

Cancel

وه امك (لا تمل اذه في اه يطخت م ت) را يخلل كل ذ ريغو DNS/WINS تام لعم را يتخ ا اضي كنك مي ة روص لا في حضورم.

New Scope Wizard

Configure DHCP Options

You have to configure the most common DHCP options before clients can use the scope.



When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

- Yes, I want to configure these options now
- No, I will configure these options later

< Back

Next >

Cancel

ةروصل لاي ف حضورم وه امك ءاهن| ددح



Completing the New Scope Wizard

You have successfully completed the New Scope wizard.

Before clients can receive addresses you need to do the following:

1. Add any scope specific options (optional).
2. Activate the scope.

To provide high availability for this scope, configure failover for the newly added scope by right clicking on the scope and clicking on configure failover.

To close this wizard, click Finish.

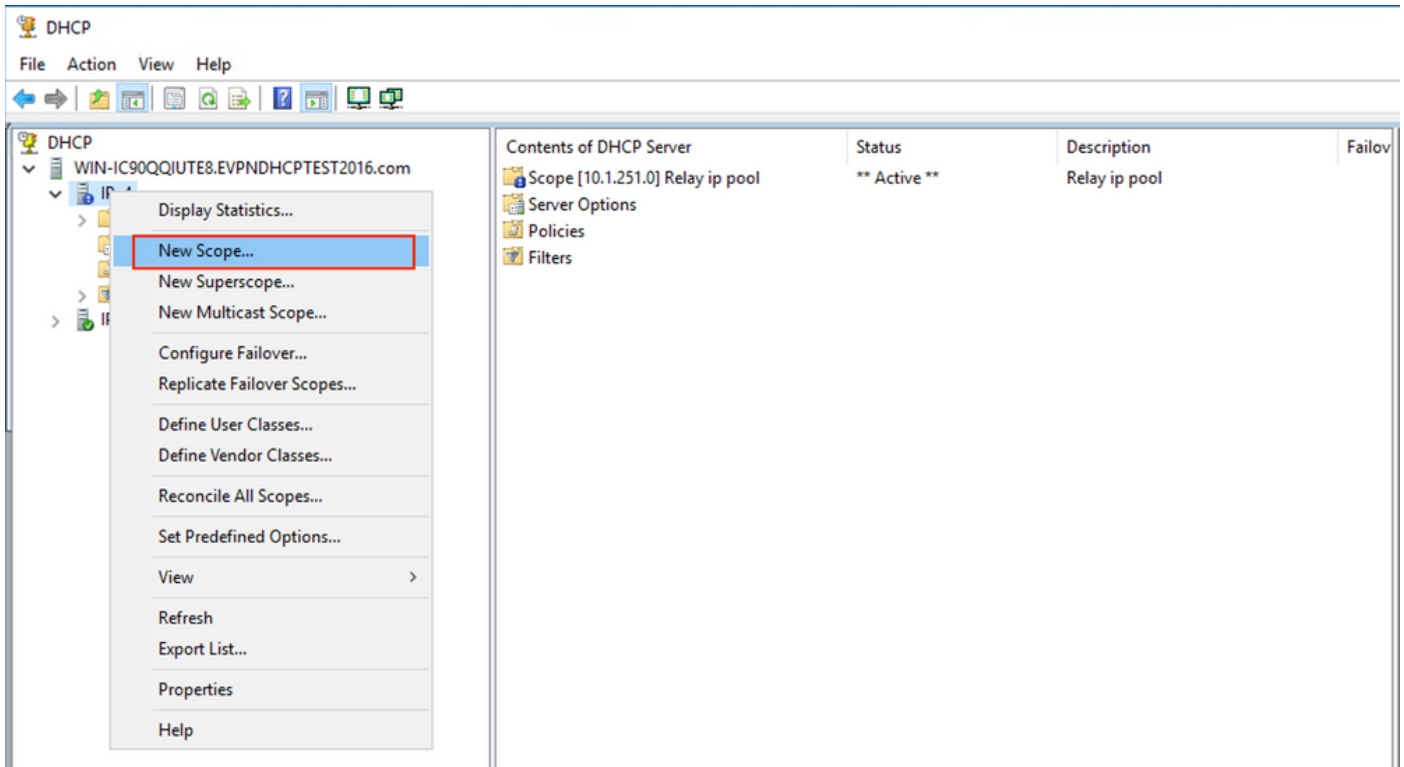
< Back

Finish

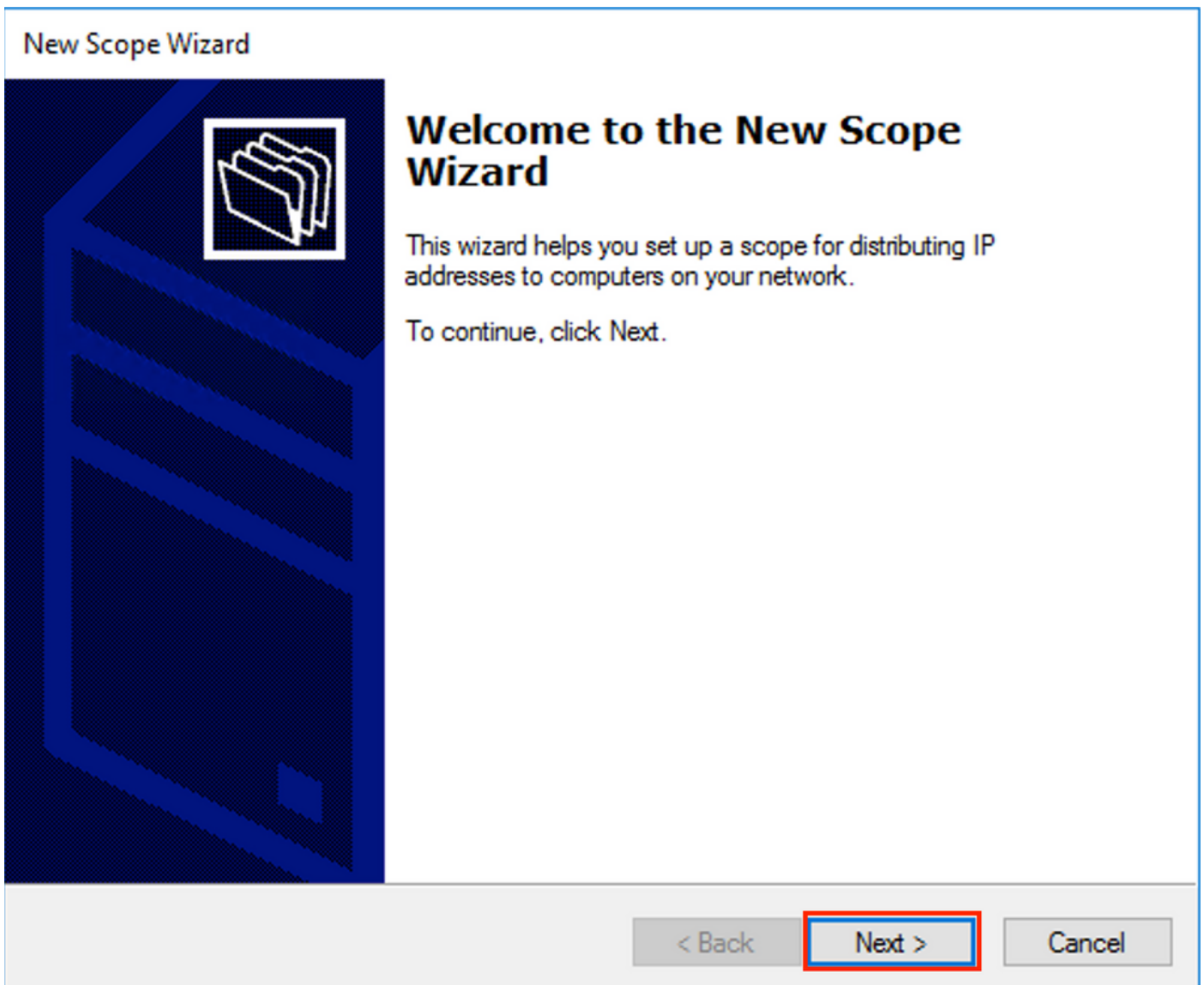
Cancel

نآلا ازهاج لاجت رالا لاجم حبصأ

- IP نيوانع ىلع هلالخ نم عالمعلا لصحي يذلا عمجتلا عاشناب مق ،كلذ دعب
- ةروصلال ي ف حضورم وه امك ديدج قاطن رتخاو نميال سواملا رزب رقنا



ةروصلال في حضورم وه امك يلاتل ادح.



ةروصلال في حضورم وه امك عمجتلل فصولو ىنعم وذ مس ارتخأ.

New Scope Wizard

Scope Name

You have to provide an identifying scope name. You also have the option of providing a description.



Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.

Name:

Description:

ةروصل لا يف حضورم وه امك VLAN101 يف صي صختلل ةحاسم ناو نعللا تلخد.

New Scope Wizard

IP Address Range

You define the scope address range by identifying a set of consecutive IP addresses.



Configuration settings for DHCP Server

Enter the range of addresses that the scope distributes.

Start IP address:

End IP address:

Configuration settings that propagate to DHCP Client

Length:

Subnet mask:

< Back

Next >

Cancel

ةروصل لآ ف ءضوم وه امك قاطن لآ نم ةضارآ لآ ةراب لآ ل IP ناوع ءانآ لآ سآ

New Scope Wizard

Add Exclusions and Delay

Exclusions are addresses or a range of addresses that are not distributed by the server. A delay is the time duration by which the server will delay the transmission of a DHCP OFFER message.



Type the IP address range that you want to exclude. If you want to exclude a single address, type an address in Start IP address only.

Start IP address:

End IP address:

Add

Excluded address range:

Address 10.1.101.1

Remove

Subnet delay in milli second:

< Back

Next >

Cancel

ةوصول لاي ف حضورم وه امك ريچأتال تقو ونبيعتب مق

New Scope Wizard

Lease Duration

The lease duration specifies how long a client can use an IP address from this scope.



Lease durations should typically be equal to the average time the computer is connected to the same physical network. For mobile networks that consist mainly of portable computers or dial-up clients, shorter lease durations can be useful. Likewise, for a stable network that consists mainly of desktop computers at fixed locations, longer lease durations are more appropriate.

Set the duration for scope leases when distributed by this server.

Limited to:

Days:

Hours:

Minutes:

< Back

Next >

Cancel

وه امك (لا تمل اذ ه ف اه يطخت مت) ديزمل او DNS/WINS ل ثم ة ف اضا | تام ل عم ن ي وكت ن ك م ي ة ر و ص ل ا ي ف ح ص و م .

New Scope Wizard

Configure DHCP Options

You have to configure the most common DHCP options before clients can use the scope.



When clients obtain an address, they are given DHCP options such as the IP addresses of routers (default gateways), DNS servers, and WINS settings for that scope.

The settings you select here are for this scope and override settings configured in the Server Options folder for this server.

Do you want to configure the DHCP options for this scope now?

- Yes, I want to configure these options now
- No, I will configure these options later

< Back

Next >

Cancel

ةروضلا يف حضوم وه امك دادعإلا لامكإل ءاهنإ ددح.

New Scope Wizard



Completing the New Scope Wizard

You have successfully completed the New Scope wizard.

Before clients can receive addresses you need to do the following:

1. Add any scope specific options (optional).
2. Activate the scope.

To provide high availability for this scope, configure failover for the newly added scope by right clicking on the scope and clicking on configure failover.

To close this wizard, click Finish.

< Back

Finish

Cancel

ديحت دن تسې. HEX ي هتقباطم تمت اولو ليحرتل IP ناووع لكل عمجتال نيوكت متي مل ي عرفال رايلال طابتر ا ديحت ال عمجتال

ةروصلال ي ف حضم وه امك ي فاضا نيوكت مزلي الو، ديح عمجتة فاضا نكمي

Contents of DHCP Server	Status	Description
Scope [10.1.102.0] Vlan102 [VNI10102] pool	** Active **	Vlan102 [VNI10102] pool
Scope [10.1.101.0] Vlan101 [VNI10101] pool	** Active **	Vlan101 [VNI10101] pool
Scope [10.1.251.0] Relay ip pool	** Active **	Relay ip pool
Server Options		
Policies		
Filters		

مداخ Linux DHCP

Linux ي لع isc-dhcp مداخ نيوكت عجار

- طابترالال دي دحتل ي عرفال رايلال وه ةيمهأ رثكألال رمالال، انه 82 لي حرتل رايلال م عدي هنا قباطتال/يرشعال ياسادسلال عانقلال وليكولا ةرئاد فرعم تامولعمب لمعال كناكم اب لازي ريثكب لهسألال نم، ةيلمعال ةيخانلال نم (Win2012 لىل ةبس نلاب مت امك) ددحمال لقحلل ليكولا ةرئاد فرعم تامولعم عم ةرشابم لمعالاب ةنراقم [5]82 مقرلال مادختسا ةي عرفال ةكبشلال فيرعت نمض طابترالال دي دحتل ي عرفال رايلال نيوكت متي.
- ةي عرفال Ubuntu Linux لي غشلال ماظن لىل ع ISC مداخ مادختسا متي، لاثمال اذ في

DHCP: مداخ تي ب ت ب مق

```
apt-get install isc-dhcp-server
```

(لا ث م في VIM ررحم مادختسا متي) `/etc/dhcp/dhcpd.conf` ررحي لدان DHCP لال ت لكش

```
vim /etc/dhcp/dhcpd.conf
```

snip تان نيوكتال (فدح متي) نيوكتال:

```
subnet 10.1.101.0 netmask 255.255.255.0 {
    option agent.link-selection 10.1.101.0; <<< suboption 82[5] definition
    option routers 10.1.101.1;
    option subnet-mask 255.255.255.0;
    range 10.1.101.16 10.1.101.254;
}

subnet 10.1.102.0 netmask 255.255.255.0 {
    option agent.link-selection 10.1.102.0; <<< suboption 82[5] definition
    option routers 10.1.102.1;
    option subnet-mask 255.255.255.0;
    range 10.1.102.16 10.1.102.254;
}

subnet 10.2.201.0 netmask 255.255.255.0 {
    option agent.link-selection 10.2.201.0; <<< suboption 82[5] definition
    option routers 10.2.201.1;
    option subnet-mask 255.255.255.0;
    range 10.2.201.16 10.2.201.254;
}

subnet 10.2.202.0 netmask 255.255.255.0 {
    option agent.link-selection 10.2.202.0; <<< suboption 82[5] definition
    option routers 10.2.202.1;
    option subnet-mask 255.255.255.0;
    range 10.2.202.16 10.2.202.254;
}
```

ل دبم لال نيوكت

انه ماع لكش ب اهم عدد متي يتال تاوهوي رانيسال ضارعتسا متي

1. VRF ريصقت 3 ةقبطال في لدان DHCP ل او VRF رجأتسمال في نوبز DHCP
 2. VRF رجأتسم هسفن ل في لدان DHCP ل او VRF رجأتسمال في نوبز DHCP
 3. فلتخم رجأتسم VRF في DHCP مداخل ورجأتسمال VRF في DHCP ليمع
 4. VXLAN ريغ فيضارتفا ريغ VRF في DHCP مداخل ورجأتسمال VRF في DHCP ليمع
- لوحمل بناج ىلع DHCP ليجرت نيوكت مزلي ،تاوهوي رانيسال هذه نم في أل

2. مقرر راخي طيسب ل ليجشت DHCP ل

```
ip dhcp relay information option <<< Enables insertion of option 82 into the packet
ip dhcp relay information option vpn <<< Enables insertion of vpn name/id to the packet - option
82[151]
```

صاخ cisco امه مداخل فرعم زواجت و طبارال ديحت في عرف راخي 82 راخي ل ، فيضارتفا لكش ب (يلاوتل ىلع 152 و 150) فيضارتفا لكش ب

▼ Option: (82) Agent Information Option

Length: 44

- ▶ Option 82 Suboption: (1) Agent Circuit ID
- ▶ Option 82 Suboption: (2) Agent Remote ID
- ▶ Option 82 Suboption: (151) VRF name/VPN ID
- ▶ Option 82 Suboption: (150) Link selection (Cisco proprietary)
- ▶ Option 82 Suboption: (152) Server ID Override (Cisco proprietary)

راخي ل ىل اهر في غت كنكم في ، ببس في أل ةصاخ ل Cisco تاراخي DHCP مداخل مه في مل اذا في سايق ل

```
ip dhcp compatibility suboption link-selection standard <<< "Link Selection" suboption
ip dhcp compatibility suboption server-override standard <<< "Server ID Override" suboption
```

▼ Option: (82) Agent Information Option

Length: 44

- ▶ Option 82 Suboption: (1) Agent Circuit ID
- ▶ Option 82 Suboption: (2) Agent Remote ID
- ▶ Option 82 Suboption: (151) VRF name/VPN ID
- ▶ Option 82 Suboption: (5) Link selection
- ▶ Option 82 Suboption: (11) Server ID Override

ة. في رورض ل VLAN تاك بشل DHCP لوكوتورب ىلع لفطتل نيكمت بجي

```
ip dhcp snooping vlan 101-102,201-202
ip dhcp snooping
```

لماش ليجشت DHCP-relay source-interface ل تلمعتسا عيطتسي تأن

```
ip dhcp-relay source-interface Loopback101
```

مراجع ال نيوكتال ةهجاو ال نيوكت زواجتي) ةهجاو ل كل نيوكت كنكمي وأ

```
interface Vlan101
vrf forwarding green
ip dhcp relay source-interface Loopback101 <<< DHCP source-interface
ip address 10.1.101.1 255.255.255.0
ip helper-address 192.168.20.20
```

نيهجات ال الك في IP لاصلت ال DHCP مداخل IP ليجرت ل IP ناوع دوجو نم ققحت

```
Leaf-01#ping vrf green 192.168.20.20 source lo101
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.20.20, timeout is 2 seconds:
Packet sent with a source address of 10.1.251.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/1 ms
```

رمأ اذه ل راخي 3 تنك عي طتسي وه DHCP مداخل ناوع نيوكت متي، ةهجاو ال نيوكت نمض
VRF سفن في مداخل ال لمعال

```
interface Vlan101
vrf forwarding green
ip dhcp relay source-interface Loopback101
ip address 10.1.101.1 255.255.255.0
ip helper-address 192.168.20.20 <<< DHCP server ip address
```

(الاثم ال اذه في رمأل اب مداخل، رضأل اب لمعال) ةفلتخم VRFs في مداخل ال لمعال

```
interface Vlan101
vrf forwarding green
ip dhcp relay source-interface Loopback101
ip address 10.1.101.1 255.255.255.0
ip helper-address vrf red 192.168.20.20 <<< DHCP server is reachable over vrf RED
end
```

(GRT) ماع ال هيجوت ال لودج في مداخل ال VRF في لمعال

```
interface Vlan101
vrf forwarding green
ip dhcp relay source-interface Loopback101
ip address 10.1.101.1 255.255.255.0
ip helper-address global 192.168.20.20 <<< DHCP server is reachable over global routing table
end
```

انه تاراخي ال عي مجل يجذومن نيوكت ةعجارم مت، نأل

VRF ريصقت 3 ةقبط ال في لدان DHCP ال VRF رجأتسم ال في نوبز DHCP

ضعب ل + ماع ل كشب DHCP ليجرت نيوكت مت. ليجرت ردصم وه GRT في Lo0، ةلحال هذه في
تاهجاو ال

لع "ip dhcp relay source-interface loopback0" دق متي، vlan101 رمأل ال ةبس نل اب، لاثم ال ل بس ال
ماع ال نيوكت ال مدختسي هنكلو،

```
ip dhcp-relay source-interface Loopback0 <<< DHCP relay source interface is Lo0
ip dhcp relay information option vpn <<< adds the vpn suboption to option 82
```



```

ip dhcp relay information option <<< enables DHCP option 82
ip dhcp compatibility suboption link-selection standard <<< switch to standard option 82[5]
ip dhcp compatibility suboption server-override standard <<< switch to standard option 82[11]
ip dhcp snooping vlan 101-102,201-202 <<< enables dhcp snooping for vlans
ip dhcp snooping <<< enables dhcp snooping globally
!
interface Loopback0
 ip address 172.16.255.3 255.255.255.255
 ip ospf 1 area 0
!
interface Vlan101
 vrf forwarding green
 ip address 10.1.101.1 255.255.255.0
 ip helper-address global 192.168.20.20 <<< DHCP is reachable over GRT
!
interface Vlan102
 vrf forwarding green
 ip dhcp relay source-interface Loopback0
 ip address 10.1.102.1 255.255.255.0
 ip helper-address global 192.168.20.20 <<< DHCP is reachable over GRT
!
interface Vlan201
 vrf forwarding red
 ip dhcp relay source-interface Loopback0
 ip address 10.2.201.1 255.255.255.0
 ip helper-address global 192.168.20.20 <<< DHCP is reachable over GRT

```

هس فن SRC IP/DST IP مادختساب GRT ربق DHCP ليجرت ةمزح لاسرا متي ،كلذل ةجيتنو
ةفلتخم ةيعرف تارايخ مادختساب نكلو.

J VLAN101:

dhcpcd

No.	delta	ip.id	Time	Source	Destination
1	0.000000	0x8bb7 (35767)	23:09:50.565098	172.16.255.3	192.168.20.20
2	0.000257	0x19a9 (6569)	23:09:50.565355	192.168.20.20	172.16.255.3
3	0.011058	0x8bb0 (35760)	23:09:50.576413	172.16.255.3	192.168.20.20

- ▶ Frame 1: 396 bytes on wire (3168 bits), 396 bytes captured (3168 bits)
- ▶ Ethernet II, Src: a0:b4:39:21:92:3f (a0:b4:39:21:92:3f), Dst: Vmware_a8:b8:b4 (00:50:56:a8:b8:b4)
- ▶ Internet Protocol Version 4, Src: 172.16.255.3, Dst: 192.168.20.20
- ▶ User Datagram Protocol, Src Port: 67, Dst Port: 67
- ▼ Bootstrap Protocol (Discover)
 - Message type: Boot Request (1)
 - Hardware type: Ethernet (0x01)
 - Hardware address length: 6
 - Hops: 1
 - Transaction ID: 0x000007f3
 - Seconds elapsed: 0
 - ▶ Bootp flags: 0x8000, Broadcast flag (Broadcast)
 - Client IP address: 0.0.0.0
 - Your (client) IP address: 0.0.0.0
 - Next server IP address: 0.0.0.0
 - Relay agent IP address: 172.16.255.3
 - Client MAC address: Cisco_43:34:c1 (f4:cf:e2:43:34:c1)
 - Client hardware address padding: 00000000000000000000
 - Server host name not given
 - Boot file name not given
 - Magic cookie: DHCP
 - ▼ Option: (53) DHCP Message Type (Discover)
 - Length: 1
- DHCP: Discover (1)
 - ▶ Option: (57) Maximum DHCP Message Size
 - ▶ Option: (61) Client identifier
 - ▶ Option: (12) Host Name
 - ▶ Option: (55) Parameter Request List
 - ▶ Option: (60) Vendor class identifier
 - ▼ Option: (82) Agent Information Option
 - Length: 44
 - ▶ Option 82 Suboption: (1) Agent Circuit ID
 - ▶ Option 82 Suboption: (2) Agent Remote ID
 - ▶ Option 82 Suboption: (151) VRF name/VPN ID
 - ▼ Option 82 Suboption: (5) Link selection
 - Length: 4
 - Link selection: 10.1.101.0
 - ▶ Option 82 Suboption: (11) Server ID Override
 - ▶ Option: (255) End

• J VLAN102:

```

▶ Frame 8: 396 bytes on wire (3168 bits), 396 bytes captured (3168 bits)
▶ Ethernet II, Src: a0:b4:39:21:92:3f (a0:b4:39:21:92:3f), Dst: Vmware_a8:b8:b4 (00:50:56:a8:b8:b4)
▶ Internet Protocol Version 4, Src: 172.16.255.3, Dst: 192.168.20.20
▶ User Datagram Protocol, Src Port: 67, Dst Port: 67
▼ Bootstrap Protocol (Discover)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 1
  Transaction ID: 0x000007f4
  Seconds elapsed: 0
▶ Bootp flags: 0x8000, Broadcast flag (Broadcast)
  Client IP address: 0.0.0.0
  Your (client) IP address: 0.0.0.0
  Next server IP address: 0.0.0.0
  Relay agent IP address: 172.16.255.3
  Client MAC address: Cisco_43:34:c3 (f4:cf:e2:43:34:c3)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
▶ Option: (53) DHCP Message Type (Discover)
▶ Option: (57) Maximum DHCP Message Size
▶ Option: (61) Client identifier
▶ Option: (12) Host Name
▶ Option: (55) Parameter Request List
▼ Option: (60) Vendor class identifier
  Length: 8
  Vendor class identifier: ciscopnp
▼ Option: (82) Agent Information Option
  Length: 44
  ▶ Option 82 Suboption: (1) Agent Circuit ID
  ▶ Option 82 Suboption: (2) Agent Remote ID
  ▶ Option 82 Suboption: (151) VRF name/VPN ID
  ▼ Option 82 Suboption: (5) Link selection
    Length: 4
    Link selection: 10.1.102.0
  ▶ Option 82 Suboption: (11) Server ID Override
▼ Option: (255) End
  Option End: 255

```

ل VLAN201 (رمحاً VRF يف نوکي يذل او):

```

▶ Frame 19: 394 bytes on wire (3152 bits), 394 bytes captured (3152 bits)
▶ Ethernet II, Src: a0:b4:39:21:92:3f (a0:b4:39:21:92:3f), Dst: Vmware_a8:b8:b4 (00:50:56:a8:b8:b4)
▶ Internet Protocol Version 4, Src: 172.16.255.3, Dst: 192.168.20.20
▶ User Datagram Protocol, Src Port: 67, Dst Port: 67
▼ Bootstrap Protocol (Discover)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 1
  Transaction ID: 0x00000ccb
  Seconds elapsed: 0
  ▶ Bootp flags: 0x8000, Broadcast flag (Broadcast)
  Client IP address: 0.0.0.0
  Your (client) IP address: 0.0.0.0
  Next server IP address: 0.0.0.0
  Relay agent IP address: 172.16.255.3
  Client MAC address: Cisco_43:34:c4 (f4:cf:e2:43:34:c4)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
  ▶ Option: (53) DHCP Message Type (Discover)
  ▶ Option: (57) Maximum DHCP Message Size
  ▶ Option: (61) Client identifier
  ▶ Option: (12) Host Name
  ▶ Option: (55) Parameter Request List
  ▶ Option: (60) Vendor class identifier
  ▼ Option: (82) Agent Information Option
    Length: 42
    ▶ Option 82 Suboption: (1) Agent Circuit ID
    ▶ Option 82 Suboption: (2) Agent Remote ID
    ▶ Option 82 Suboption: (151) VRF name/VPN ID
    ▼ Option 82 Suboption: (5) Link selection
      Length: 4
      Link selection: 10.2.201.0
    ▶ Option 82 Suboption: (11) Server ID Override
  ▶ Option: (255) End

```

01-01 قورولا ىل ةهجاولا نم 01-يسيسئرلا دوماعلا ىلع ةمزحلا طاقنلا م ت:

```
Spine-01#sh mon cap TAC buff br | i DHCP
```

```

5401 4.402431 172.16.255.3 b^F^R 192.168.20.20 DHCP 396 DHCP Discover - Transaction ID 0x1feb
5403 4.403134 192.168.20.20 b^F^R 172.16.255.3 DHCP 362 DHCP Offer - Transaction ID 0x1feb
5416 4.418117 172.16.255.3 b^F^R 192.168.20.20 DHCP 414 DHCP Request - Transaction ID 0x1feb
5418 4.418608 192.168.20.20 b^F^R 172.16.255.3 DHCP 362 DHCP ACK - Transaction ID 0x1feb

```

ةلسبك ةىلمع VXLAN ى نود ip بل ىف طبر DHCP ل:

```
Spine-01#sh mon cap TAC buff det | b Frame 5401:
```

```

Frame 5401: 396 bytes on wire (3168 bits), 396 bytes captured (3168 bits) on interface 0
<...skip...>
[Protocols in frame: eth:ethertype:ip:udp:dhcp]
Ethernet II, Src: 10:b3:d5:6a:8f:e4 (10:b3:d5:6a:8f:e4), Dst: 7c:21:0d:92:b2:e4 (7c:21:0d:92:b2:e4)
<...skip...>
Internet Protocol Version 4, Src: 172.16.255.3, Dst: 192.168.20.20
<...skip...>
User Datagram Protocol, Src Port: 67, Dst Port: 67
<...skip...>
Dynamic Host Configuration Protocol (Discover)
<...skip...>

```

VRF تالكبش ل ليحرت ل IP ناو نع س فن مادختس | ك نكمي هنأ وه جهنلا اذه نم ةري بك ةدئاف
VRF تالكبشو ةفلتخم ل VRF تالكبش ني ب راسم ل برست نودب ةفلتخم ل رجأتسم ل
ةيملع ل.

VRF رجأتسم هس فن ل ي ف لدان DHCP و نوبز DHCP

رجأتسم ل VRF ي ف ليحرت ل IP ناو نع كي دل نو كي نأ ي قطنم ل نم ، ةلح ل هذه ي ف

ل: وحم ل ني وكت

```
ip dhcp relay information option vpn <<< adds the vpn suboption to option 82
ip dhcp relay information option <<< enables DHCP option 82
ip dhcp compatibility suboption link-selection standard <<< switch to standard option 82[5]
ip dhcp compatibility suboption server-override standard <<< switch to standard option 82[11]
ip dhcp snooping vlan 101-102,201-202 <<< enables dhcp snooping for vlans
ip dhcp snooping <<< enables dhcp snooping globally
!
interface Loopback101
vrf forwarding green
ip address 10.1.251.1 255.255.255.255
!
interface Vlan101
vrf forwarding green
ip dhcp relay source-interface Loopback101
ip address 10.1.101.1 255.255.255.0
ip helper-address 192.168.20.20 <<< DHCP is reachable over vrf green
!
interface Vlan102
vrf forwarding green
ip dhcp relay source-interface Loopback101
ip address 10.1.102.1 255.255.255.0
ip helper-address 192.168.20.20 <<< DHCP is reachable over vrf green
```

J VLAN101:

```

▶ Frame 1: 396 bytes on wire (3168 bits), 396 bytes captured (3168 bits)
▶ Ethernet II, Src: a0:b4:39:21:92:3f (a0:b4:39:21:92:3f), Dst: Vmware_a8:b8:b4 (00:50:56:a8:b8:b4)
▶ Internet Protocol Version 4, Src: 10.1.251.1, Dst: 192.168.20.20
▶ User Datagram Protocol, Src Port: 67, Dst Port: 67
▼ Bootstrap Protocol (Discover)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 1
  Transaction ID: 0x000016cc
  Seconds elapsed: 0
▶ Bootp flags: 0x8000, Broadcast flag (Broadcast)
  Client IP address: 0.0.0.0
  Your (client) IP address: 0.0.0.0
  Next server IP address: 0.0.0.0
  Relay agent IP address: 10.1.251.1
  Client MAC address: Cisco_43:34:c1 (f4:cf:e2:43:34:c1)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
▶ Option: (53) DHCP Message Type (Discover)
▶ Option: (57) Maximum DHCP Message Size
▶ Option: (61) Client identifier
▶ Option: (12) Host Name
▶ Option: (55) Parameter Request List
▶ Option: (60) Vendor class identifier
▼ Option: (82) Agent Information Option
  Length: 44
  ▶ Option 82 Suboption: (1) Agent Circuit ID
  ▶ Option 82 Suboption: (2) Agent Remote ID
  ▶ Option 82 Suboption: (151) VRF name/VPN ID
  ▼ Option 82 Suboption: (5) Link selection
    Length: 4
    Link selection: 10.1.101.0
  ▶ Option 82 Suboption: (11) Server ID Override
▶ Option: (255) End

```

J VLAN102:

```

▶ Frame 5: 396 bytes on wire (3168 bits), 396 bytes captured (3168 bits)
▶ Ethernet II, Src: a0:b4:39:21:92:3f (a0:b4:39:21:92:3f), Dst: Vmware_a8:b8:b4 (00:50:56:a8:b8:b4)
▶ Internet Protocol Version 4, Src: 10.1.251.1, Dst: 192.168.20.20
▶ User Datagram Protocol, Src Port: 67, Dst Port: 67
▼ Bootstrap Protocol (Discover)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 1
  Transaction ID: 0x000016cd
  Seconds elapsed: 0
  ▶ Bootp flags: 0x8000, Broadcast flag (Broadcast)
  Client IP address: 0.0.0.0
  Your (client) IP address: 0.0.0.0
  Next server IP address: 0.0.0.0
  Relay agent IP address: 10.1.251.1
  Client MAC address: Cisco_43:34:c3 (f4:cf:e2:43:34:c3)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
  ▶ Option: (53) DHCP Message Type (Discover)
  ▶ Option: (57) Maximum DHCP Message Size
  ▶ Option: (61) Client identifier
  ▶ Option: (12) Host Name
  ▶ Option: (55) Parameter Request List
  ▼ Option: (60) Vendor class identifier
    Length: 8
    Vendor class identifier: ciscopnp
  ▼ Option: (82) Agent Information Option
    Length: 44
    ▶ Option 82 Suboption: (1) Agent Circuit ID
    ▶ Option 82 Suboption: (2) Agent Remote ID
    ▶ Option 82 Suboption: (151) VRF name/VPN ID
    ▼ Option 82 Suboption: (5) Link selection
      Length: 4
      Link selection: 10.1.102.0
    ▶ Option 82 Suboption: (11) Server ID Override
  ▼ Option: (255) End
    Option End: 255

```

Leaf-01 إلى SPINE-01 هجاءو نم ةمزح طاقا ل:

```

Spine-01#sh monitor capture TAC buffer brief | i DHCP
2 4.287466 10.1.251.1 b^F^R 192.168.20.20 DHCP 446 DHCP Discover - Transaction ID 0x1894
3 4.288258 192.168.20.20 b^F^R 10.1.251.1 DHCP 412 DHCP Offer - Transaction ID 0x1894
4 4.307550 10.1.251.1 b^F^R 192.168.20.20 DHCP 464 DHCP Request - Transaction ID 0x1894
5 4.308385 192.168.20.20 b^F^R 10.1.251.1 DHCP 412 DHCP ACK - Transaction ID 0x1894

```

VXLAN: نيمضت زك رمل ا في DHCP ةمزح نمضتت

```

Frame 2: 446 bytes on wire (3568 bits), 446 bytes captured (3568 bits) on interface 0
<...skip...>
[Protocols in frame: eth:ethertype:ip:udp:vxlan:eth:ethertype:ip:udp:dhcp]
Ethernet II, Src: 10:b3:d5:6a:8f:e4 (10:b3:d5:6a:8f:e4), Dst: 7c:21:0d:92:b2:e4 (7c:21:0d:92:b2:e4)
<...skip...>
Internet Protocol Version 4, Src: 172.16.254.3, Dst: 172.16.254.5 <<< VTEP IP addresses
<...skip...>
User Datagram Protocol, Src Port: 65283, Dst Port: 4789
<...skip...>

```



```

▶ Frame 7: 394 bytes on wire (3152 bits), 394 bytes captured (3152 bits)
▶ Ethernet II, Src: a0:b4:39:21:92:3f (a0:b4:39:21:92:3f), Dst: Vmware_a8:b8:b4 (00:50:56:a8:b8:b4)
▶ Internet Protocol Version 4, Src: 10.1.251.1, Dst: 192.168.20.20
▶ User Datagram Protocol, Src Port: 67, Dst Port: 67
▼ Bootstrap Protocol (Discover)
  Message type: Boot Request (1)
  Hardware type: Ethernet (0x01)
  Hardware address length: 6
  Hops: 1
  Transaction ID: 0x000016ce
  Seconds elapsed: 0
  ▶ Bootp flags: 0x8000, Broadcast flag (Broadcast)
  Client IP address: 0.0.0.0
  Your (client) IP address: 0.0.0.0
  Next server IP address: 0.0.0.0
  Relay agent IP address: 10.1.251.1
  Client MAC address: Cisco_43:34:c4 (f4:cf:e2:43:34:c4)
  Client hardware address padding: 00000000000000000000
  Server host name not given
  Boot file name not given
  Magic cookie: DHCP
  ▶ Option: (53) DHCP Message Type (Discover)
  ▶ Option: (57) Maximum DHCP Message Size
  ▶ Option: (61) Client identifier
  ▶ Option: (12) Host Name
  ▶ Option: (55) Parameter Request List
  ▶ Option: (60) Vendor class identifier
  ▼ Option: (82) Agent Information Option
    Length: 42
    ▶ Option 82 Suboption: (1) Agent Circuit ID
    ▶ Option 82 Suboption: (2) Agent Remote ID
    ▶ Option 82 Suboption: (151) VRF name/VPN ID
    ▼ Option 82 Suboption: (5) Link selection
      Length: 4
      Link selection: 10.2.201.0
    ▶ Option 82 Suboption: (11) Server ID Override
  ▶ Option: (255) End

```

Leaf-01 إلى SPINE-01 هجاءو لى عمزحلا طاقلا

```
Spine-01#sh mon cap TAC buff br | i DHCP
```

```

2 0.168829 10.1.251.1 b^F^R 192.168.20.20 DHCP 444 DHCP Discover - Transaction ID 0x10db
3 0.169450 192.168.20.20 b^F^R 10.1.251.1 DHCP 410 DHCP Offer - Transaction ID 0x10db
4 0.933121 10.1.251.1 b^F^R 192.168.20.20 DHCP 462 DHCP Request - Transaction ID 0x10db
5 0.933970 192.168.20.20 b^F^R 10.1.251.1 DHCP 410 DHCP ACK - Transaction ID 0x10db

```

فلغى VXLAN بل يف طبلا، لاثم اذه يف

```
Frame 2: 446 bytes on wire (3552 bits), 444 bytes captured (3552 bits) on interface 0
```

```
<...skip...>
```

```
[Protocols in frame: eth:ethertype:ip:udp:vxlan:eth:ethertype:ip:udp:dhcp]
```

```
Ethernet II, Src: 10:b3:d5:6a:8f:e4 (10:b3:d5:6a:8f:e4), Dst: 7c:21:0d:92:b2:e4 (7c:21:0d:92:b2:e4)
```

```
<...skip...>
```

```
Internet Protocol Version 4, Src: 172.16.254.3, Dst: 172.16.254.5 <<< VTEP IP addresses
```

```
<...skip...>
```

```
User Datagram Protocol, Src Port: 65283, Dst Port: 4789
```

```
<...skip...>
```

```
Virtual eXtensible Local Area Network
```

```
Flags: 0x0800, VXLAN Network ID (VNI)
```

```
0... .. = GBP Extension: Not defined
```

```

.... .0.. .... = Don't Learn: False
.... 1... .... = VXLAN Network ID (VNI): True
.... .... 0... = Policy Applied: False
.000 .000 0.00 .000 = Reserved(R): 0x0000
Group Policy ID: 0
VXLAN Network Identifier (VNI): 50901 <<< L3VNI for VRF green
Reserved: 0
<--- Inner header started --->
Ethernet II, Src: 10:b3:d5:6a:00:00 (10:b3:d5:6a:00:00), Dst: 7c:21:0d:bd:27:48
(7c:21:0d:bd:27:48)
<...skip...>
Internet Protocol Version 4, Src: 10.1.251.1, Dst: 192.168.20.20
<...skip...>
User Datagram Protocol, Src Port: 67, Dst Port: 67
<...skip...>
Dynamic Host Configuration Protocol (Discover)
<...skip...>

```

VXLAN VRF ريغ رخآ يف لدان DHCP و VRF رجأتسم دحاوي يف نوبز DHCP

نيمضت ىلع يوتحت ال مزحلل نأ وه يسيسئرلا قرفلا. ةريخألا ةلحلال ادج ةهباشم ةلحلال هذه نيوكتلا روظنم نم اهسفن اه نكلو، (كلاذ ىلا ام و/م PL/M) رخآءيش يا وأ يقن IP - VXLAN

VRF. رضألأاب مداخل او VRF رمألأاب نوللاب ليمعلا نوكي، لاثملا اذه يف

نارايخ كيدل:

- راسملا ليحست نيوكتب موقويو ليمعلا اب صاخلا VRF فلم يف IP Relay لوكتورب دجوي ديقتتلا نم اديزم فيضي يذلا
- ىلوالا ةلحلال يف GRT ل هب مايقلا مت امل لثامم) مداخل اب صاخلا VRF يف IP Relay دجوي ىلوالا ةوطخلا راركت تالوكتورب نم ريثكللا نأل ارظن ي ناثلا جهنلا رايخا طسبألا نم راسملا بيرست ىلا ةجالح الو ةم و عدم ءالمعلا اب ةصاخلا (VRFs)

لوحمللا نيوكت:

```

ip dhcp relay information option vpn <<< adds the vpn suboption to option 82
ip dhcp relay information option <<< enables DHCP option 82
ip dhcp compatibility suboption link-selection standard <<< switch to standard option 82[5]
ip dhcp compatibility suboption server-override standard <<< switch to standard option 82[11]
ip dhcp snooping vlan 101-102,201-202 <<< enable dhcp snooping for vlans
ip dhcp snooping <<< enable dhcp snooping globally
!
interface Loopback101
vrf forwarding green
ip address 10.1.251.1 255.255.255.255
!
interface Vlan201
vrf forwarding red
ip dhcp relay source-interface Loopback101
ip address 10.2.201.1 255.255.255.0
ip helper-address vrf green 192.168.20.20 <<< DHCP is reachable over vrf green

```

ةلص تاذا تامولعم

- [RFC 3046 راي عمل](#)
- [RFC 3527 راي عمل](#)
- <https://docs.microsoft.com>

- [تادنت سمل او ینقتلا مرعدلا - Cisco Systems](#)

ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن م ة و مچ م ادخت ساب دن تسمل اذ ه Cisco ت مچرت
ملاعلاء ان ا عي مچ ي ف ن ي م دخت سمل ل م عد ي و تح م مي دقت ل ة ي رش ب ل و
امك ة ق ي قد ن و ك ت ن ل ة ي ل ا ة مچرت ل ض ف ا ن ا ة ظ حال م ي ج ر ي . ة ص ا خ ل م ه ت غ ل ب
Cisco ي ل خ ت . ف ر ت ح م مچرت م ا ه م د ق ي ي ت ل ا ة ي ف ا ر ت ح ا ل ا ة مچرت ل ا ع م ل ا ح ل ا و ه
ي ل ا م ا د ع و ج ر ل ا ب ي ص و ت و ت ا مچرت ل ا ه ذ ه ة ق د ن ع ا ه ت ي ل و ئ س م Cisco
Systems (ر ف و ت م ط ب ا ر ل ا) ي ل ص ا ل ا ي ز ي ل ج ن ا ل ا دن تسمل ا