

# يوتسمال نم ددعتمال ثبلا: ةللاح ةسارد لوصولا يف مكحتلا ةهجاو ةينب يف ثلاثلا (ACI)

## تايوتحمل

[ةمدقملا](#)

[مهمصتلا تابلطتم](#)

[لحل](#)

[نيوكتلا](#)

[ةحصلال نم ققحتلا](#)

## ةمدقملا

اءدب (ACI) لوصولا يف مكحتلا ةهجاو ةينب يف 3 ةقبطلا نم ثبلا ددعتم هيچوتلا معد متي تناك، 2.0 رادصالا لبق. EX تالوحم بلطتي وهدعب امو 2.0 رادصالا نم لاجم لخاد طقف يثلاثلا يوتسمال نم ددعتمال ثبلا معدت (ACI) لوصولا يف مكحتلا ةمئاق EX ريغ تالوحملل همادختسا نمكيو 2.0 يف احلاص راخلا اذه لازي ام. رسلال

ددعتمال ثبلا هيچوتلا تازيم نمضتت (ACI) لوصولا يف مكحتلا ةهجاو نم 2.0 رادصالا يف PIM ASM، PIM SSM، RP تباثلا، PIM Auto-RP، و PIM BSR. يلي ام ةمؤعدملا

ءالمعلل يقيقح رشن ويرانيسل هتحص نم ققحتلا مت للافصو مدقن، دنتسمال اذه يف (ACI) لوصولا يف مكحتلا ةمئاق ةينب يلع ثلاثلا يوتسمال نم ددعتمال ثبلا هيچوتل RP لوكتورب رادصالا اذه معددي ال. 2.1(1h) وه ةددحمل (ACI) لوصولا يف مكحتلا ةمئاق رادصالا PIM ASM لوكتوربل يجرخ RP لوكتورب دوجو مزلي م ثنمو، ةينبال يلع

## مهمصتلا تابلطتم

اهجرخو ةينبالا لخاد ثلاثلا يوتسمال نم ثبلا ددعتم هيچوتلل لماش لحيلا ليمعلا جاتيحي يلي ام رشنلا ويرانيس مزلتسيو

- نيرجاتسمال عيمجل دحاو VRF ددرت رشن مت

في VRFs ددعتي كانه ن. VRF ل كل صصخم L3 جرخ دوجو ددعتمال ثبلا بلطتي: ةطخالما دشحت multicast ل دناسي ال كرتشم L3out، ءانبالا

- ةيجراخ رداصمب ةدوزم ةينبالا يف لابققتسا ةزهجا
- ةيجراخ لابققتسا ةزهجا عم لكيلهلا لخاد رداصم
- جيسناللا يف تالابققتسمال او رداصملا
- Auto-RP و تباثلا RP

## لحل

ططخمالا ةعجارم



# نېوكتلا

نېكمتو سيئيئرلا زكرملا ب ق فرملا يكاحملا WAN ةكبش زاغ ىلع RP دادعاب مق: 0 ةوطخلا  
تاقبب ي ف LAN ةكبش ةزهجأ ىلع PIM ةردن عضو

```
!!!! RP configuration

ip pim rp-address 99.99.99.99 group-list 224.0.0.0/4
ip pim ssm range 232.0.0.0/8

interface loopback99
 ip address 99.99.99.99/32
 ip router ospf 65017 area 0.0.0.0
 ip pim sparse-mode

interface Ethernet2/1
 ip pim sparse-mode

interface Ethernet2/2
 ip pim sparse-mode
```

> ةكبشلا ىلا لقتنا، رجأتسملا ةحاسم ي ف VRF ي ف ددعتملا ثبلا نېكمتب مق: 1 ةوطخلا  
ددعتملا ثبلا نېكمتل دبزل رقنا، لمعلا ةحول ي ف، ددعتملا ثبلا > VRF

PIM is not enabled on this VRF. Would you like to enable PIM?

YES, ENABLE MULTICAST.

BD تاقاطب ل IGMP نېكمت، L3out و BD تايوتسم ىلع ددعتملا ثبلا نېكمت: 2 ةوطخلا  
دح، لمعلا ةحول ىلع، ددعتملا ثبلا > VRF م سا > VRFs > ةكبشلا ىلا لقتنا. لبق تسملا  
رورم ةكرح دوجو ةقوت ي شيح رسجلا تالاجم ةفاضلا "+" رقنا، "ةهجاو" بيوبتلا ةمالع > نيوكت  
ددعتملا ثبلا نېكمت ل BD ل IMGP جهن نېكمت. ةددعتم

لك ىلع PIM نكمتيس وه L3out ل multicast تنكمتنك ممدنع. اذه VRF ل L3out ةفاضلا "+" رقنا م  
PIM ةسايس دح. دشحت multicast م تنكمتنك ل3out نأ ل كرتي دودحلا لكو، L3out تحت نراق  
L3out ةهجاو تاعومجمل

لعللاب دوزم L3out و BDs نأ ضررتفن انه

**Multicast**

Enable

BD	IGMP Policy
Zone_C/BD91	common/default
Zone_A/BD31	common/default
Zone_A/BD32	common/default
Zone_C/BD90	common/default
Zone_C/BD101	common/default

L3 Out	Interface Group	Interface	IGMP Policy	PIM Policy
L3Out_To_Core	L3Out_To_Core1	pod-1/131[eth1/4] pod-1/132[eth1/4]	common/default	common/default
	L3_out_To_Core2	pod-1/131[eth1/5] pod-1/132[eth1/5]	common/default	common/default

اهل عجي (BD) تنرتن إلالا عومجم ةرادإ لو كوتورب تانايب تادحوب IGMP ةسايس قافرا نأ امك تاسايس > ةكبشلالا > رجأتسملال تحت IGMP ةسايس نيوكت متي. كلذك IGMP ملعتسم كنكمي شيح ةيلالال تاملعملال ىل عيضا رتفالال IGMP. ةهجاو > لو كوتوربلال جهنلال ةهجاوالا مدختستس، جهن يأ ديدحت مدع ةلاح يف. مالعتسالال لصاوف ديدحت يضا رتفالال.

**IGMP Interface Policy - default**

Name: default

Description: optional

Control:  Allow v3 ASM  Fast Leave  Report Link Local Groups

Group Timeout (sec): 260

Query Interval (sec): 125

Query Response Interval (sec): 10

Last Member Count: 2

Last Member Response Time (sec): 1

Version: **Version 2** | Version 3

Startup Query Count: 2

Startup Query Interval (sec): 31

Querier Timeout (sec): 255

Robustness Variable: 2

State Limit Route Map: select an option

Maximum Multicast Entries: \_\_\_\_\_

Reserved Multicast Entries: \_\_\_\_\_

Report Policy Route Map: select an option

Static Report Route Map: select an option

PIM > لو كوتوربلال تاسايس > ةكبشلالا > رجأتسملال تحت PIM جهن نيوكت متي امك.

ببجرتلال لصاوف ديدحت كنكمي شيح ةيلالال تاملعملال ىل عيضا رتفالال PIM جهن يوتحي.

The screenshot shows the Cisco SD-WAN GUI for editing an interface policy. The left sidebar shows a tree view with 'Networking' and 'PIM Policies' expanded. The main panel is titled 'Edit Interface Policy' and shows the following configuration:

- Name: default
- Auth Type: MD5 HMAC authentication (selected), No authentication
- Control State:  Multicast Domain Boundary,  Passive,  Strict RFC Compliant
- Designated Router Delay (seconds): 3
- Designated Router Priority: 1
- Hello Interval (milliseconds): 30000 (highlighted with a red box)
- Join-Prune Interval Policy (seconds): 60
- Interface-level Inbound Join-Prune Filter Policy: select an option
- Interface-level Outbound Join-Prune Filter Policy: select an option
- Interface-level Neighbor Filter Policy: select an option

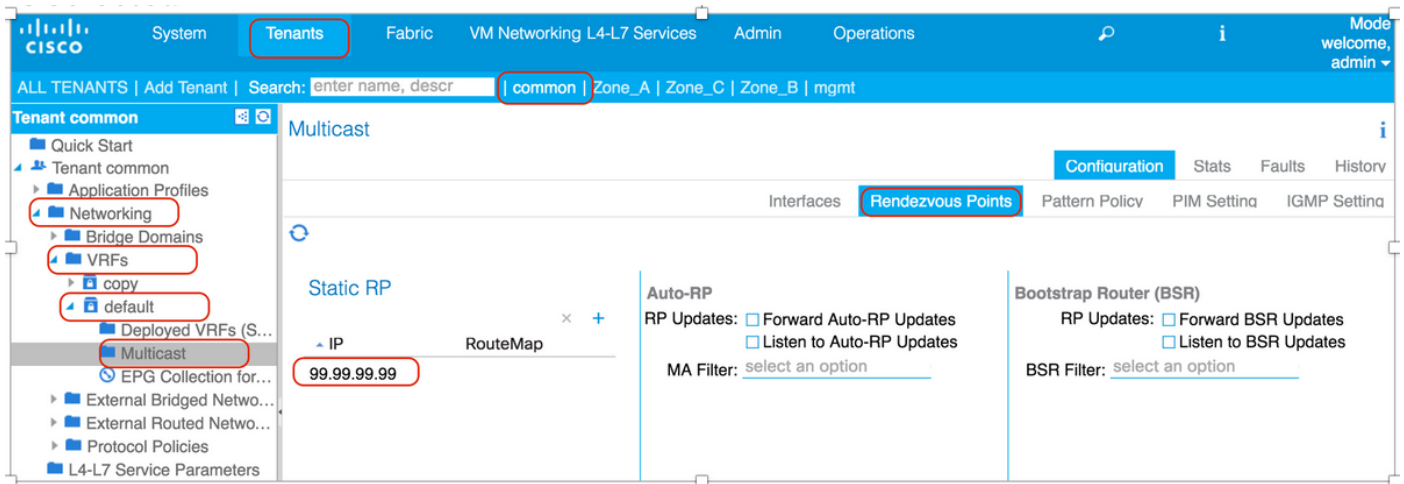
في رعت فلم في ةنك مالم اعاجرت سالان في وانع مادخت ساب دودحل ة قرو لى ل3Out ني وكت بجي ةدق ةل.

The screenshot shows the Cisco SD-WAN GUI for editing a logical node profile. The left sidebar shows a tree view with 'Networking' and 'External Routed Networks' expanded. The main panel is titled 'Logical Node Profile - L3Out\_To\_Core\_NP' and shows the following configuration:

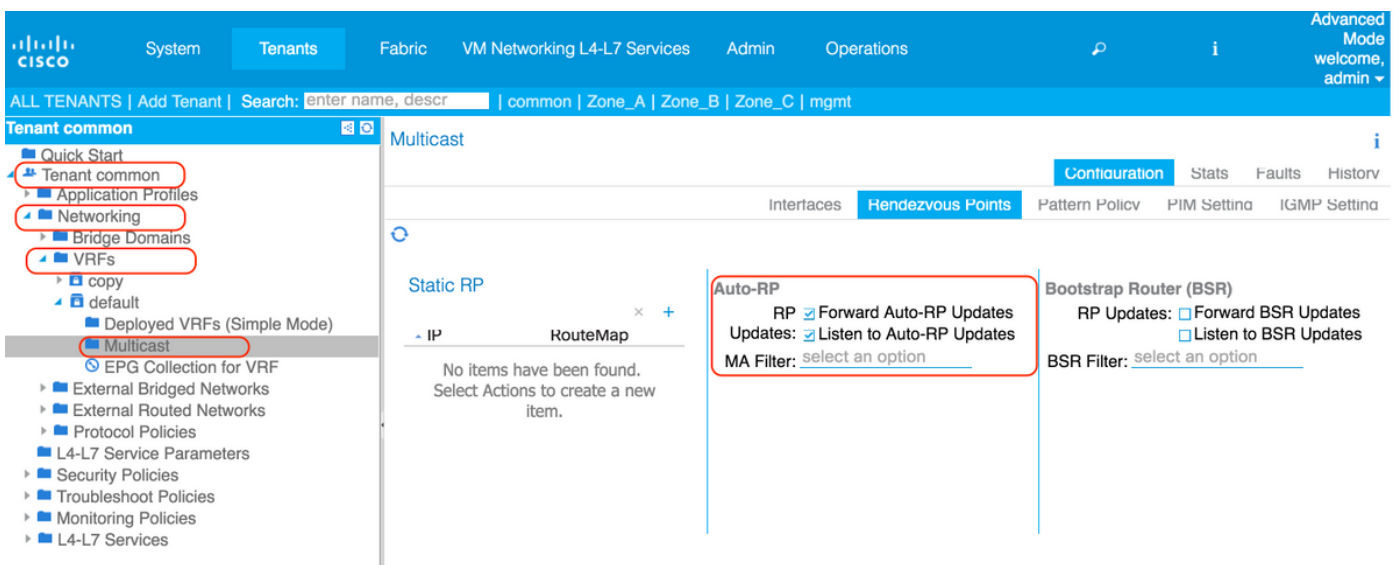
- Name: L3Out\_To\_Core\_NP
- Description: optional
- Alias: (empty)
- Target DSCP: Unspecified
- Nodes:
 

Node ID	Router ID	Static Routes	Loopback Address
topology/pod-1/node-131	131.131.131.1		131.131.131.1 (highlighted with a red box)
topology/pod-1/node-132	132.132.132.1		132.132.132.1 (highlighted with a red box)

ةحول في ، ددعت مالم ثبل ل > VRF > رجأت س مالم لى ل لقتنا . PIM ASM ل RP ني وكت : 3 ةوطخل قوف رونا . في كي تات س ل نك اس rp تي ققتنا ، لاثم اذه في . عي مجت طاقن > لى كشت دح لم ةل RP . ةفاض ل "+" .



RP تاشيحت هي جوت ةداع" ب ةصاخلا تاعبرملا دح، ةيئاقلا ل RP نيوكت يلع لوصحلل "عيجم جلال طاقن" ةحفص يلع "ةيئاقلا ل RP تاشيحت يلى عامتسال" و "ةيئاقلا ل".



NX ليغشت ةمظنا يلع Auto-RP تانيوكت لظت، (ACI) تاقيبطتلا ةجمر ب ةهجاو ةيئاق جراحو اهسفن يه.

!!! On RP candidate

```
ip pim send-rp-announce loopback99 group-list 224.0.0.0/4
ip pim send-rp-discovery loopback99 scope 32
```

!!! On RP listeners:

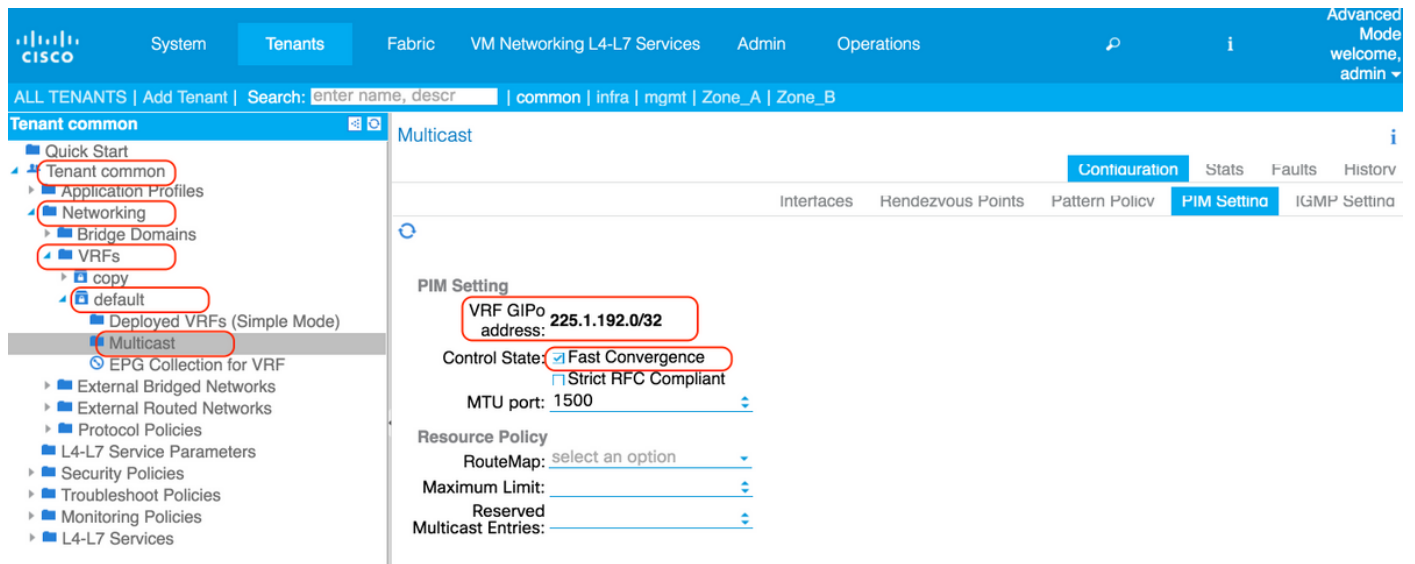
```
ip pim auto-rp listen forward
```

في، ددعتملا ثبلا -> VRF رجأتسملا يلى لقتنا. ةيروضلا PIM تاداع نيوكت: **4 ةوطخل** يذلا 225.1.192.0/32 VRF ب صاخلا GPO ناوع طحال، PIM تاداع > نيوكتلا دح، لمعلا ةحول VRF مادختسا متيس. ددعتملا ثبلا ةعومجم نيوانع عمجت نم APIC ةطساوب هنييعت مت عم اهنكيكمت مت يتلا BDs ل ددعتملا ثبلا رورم ةكرحل ةيجراخلا ةعومجم ل IP ناوعك GPO PIM.

لئاسر عيجم لسرت، (ليطعت وه يضارتفالا دادعالا) عيرسلا براقلا عضو نيكمت دنع ةدحاو دودح ةقرو موقت نكلو، ةيجراخلا ةكبشلا وحن تالصولا PIM عم اهنكيكمت مت يتلا دودحلا دودحلا ةقرو ربتعت. تاراركتلا عنمل ةيئاقلا يلى تانايبلا رورم ةكرح هي جوت ةداعاب طقف دعاسي. ةعومجم ل ل نيوعملا يه ةعومجم لاب ةصاخلا رورملا ةكرح هي جوت ديعت يتلا

عم ددعتم لثب ل تاق ف د تل ة مزح ل طاق س ا ة دم ل ل ل ق ت ي ل ع ع ي رس ل ل ب راق ت ل ا ن ي ك م ت ي ط ي ر ش ل ل ك ر ت ش م ل ل ر ي غ ت ك ا ن ه ن و ك ي ا م د ن ع ، ة ي ل خ ا د ل ا ت ا ل ب ق ت س م ل ا و ة ي ج ر ا خ ل ا ر د ا ص م ل ا . د ي د ج ل ا ح ب ا ر ل ا ن م PIM ة ر ج ش ب ق ا ح ت ل ل ل ل ا ق ت ن ا ن م ز د ج و ي ا ل . د و د ح ل ا ة ق ر و ض ا ف خ ن ا ب ب س ب ر ي غ ن و ز ي ا ف ل ل ة ي ج ر ا خ ل ا ت ا ل ص و ل ا ي ل ع ي ف ا ض ا ل ا ق ا ط ن ل ل ا ض ر ع م ا د خ ت س ا ب ا س ح ي ل ع ا ذ ه ي ت ا ي و ي ج ر a خ ل ا ر د ص م ل ا ن م ر و ر م ل ا ب ح س ت د و د ح ل a ج ر a خ م ل ك ن ا ث ي ح ن ي ط ط ا خ م ل a

هجوم) BSR هي نتجت ايلاح (ACI) لوصول ا ي ف م ك ح ت ل ا ة م ئ ا ق م د خ ت س ت - ط و ط ا خ ل ا ب ن ي ز ي ا ف ل a ل و ح Bootstrp) Loopback IP و S.G م ا د خ ت س ا ب ة ي ج ت ل a ب ا س ح م ت ي . B.L ط ي ر ش ب ز ي ا ف ل a ب ا س ح ل ( Bootstrap ا ف ل a ب ا خ ت ن a ي ل ع ر ي ث ا ت ل ل ة ق ي ر ط د ج و ت a ل ، (1) ACI 3.0 ر ا ي ع م ل a ن م ا ر ا ب ت ع a و . ة ق ر و ل a ب ص ا خ ل a م د خ ت س م ل ل ط ط ا خ م ل a



ددعتم لثب ل رورم ة ك ر ح ب ح ا م س ل ل م ز ا ل ل ا د ق ع ل a ء ا ش ن ا ب م ق : 5 ة و ط ا خ ل a

- (ي رورض ر ي غ د ق ع ل a) ة ي ن ب ل a ل خ ا د م ل ت س م ل a و ر د ص م ل a -
  - (ي رورض ر ي غ د ق ع ل a) ي ج ر a خ ر د ص م ، ة ي ن ب ل a ل خ ا د ل ا ب ق ت س ا ز ا ج -
  - (\* د ق ع د و ج و م ز ل ي) ي ج ر a خ ل a ب ق ت س ا ز ا ج ، ة ي ن ب ل a ل خ ا د ر د ص م -
- ة ي د و د ح ل a ة ق ر و ل a ي ل ع B D ر ش ن م ت ا ذ ا ا ب و ل ط م د ق ع ل a ن و ك ي a ل \*

ثب ل a ر د ص م و L3out\_to\_Core ن ي ب د ق ع ل a ق ي ب ط ت ، ة ي ن ب ل a ج ر a خ ت a ل ب ق ت س م ا ن ي د ل ، ا ن ت ل a ح ي ف EPG101 ي ف

The screenshot shows the Cisco ISE GUI for configuring a shared L3Out contract. The left sidebar displays the navigation tree with 'Security Policies' and 'Contracts' expanded, and 'shared\_L3Out' selected. The main area shows a topology diagram with nodes for 'L3', 'EPG101(App...)', and 'Contract shared\_L3Out'.

## تحصيل نام ققحتال

### PIM نام ققحتال

ثب ل هجوتل (ق فن) ةي ن ب ةه جاو عاشن ا متي ، ددعت مل ثب ل هجوتل VRF ني كمت متي ام دن ع ل خاد ةي ن ب ل ا ه جاو رب ع PIM ي ف م كحتال ي وت سم مز ح ل اس را متي . ةي ن ب ل ا ل خاد ددعت مل ا ةي دودحل ا ق رول ا ح ات ف م ل ع . VRF GiPo ددعت مل ثب ل ا ناون ع ق فن ل ا ه جاو نوكت س . ةي ن ب ل ا ري غ ةي ف رطال ا ل و ح م ل ا ي ف . ةي دودحل ا ق رول ا ل ع ا ج ا رت س ا ل ا ه جاو ق فن ل ا ر د ص م نوكت س ةي دودحل ا (127.0.0.100) ع ا ج ا رت س ا ناون ع ق فن ل ا ر د ص م نوكت س ةي دودحل ا

ع ض و ل ا ي ف PIM ل غ ش ت L3Out ا ه جاو ةي ن ب ل ا ه جاو ل ع PIM زم ر ل اس ر ا ب دودحل ا ق ا ر و ا م و ق ت ر ي س ت و . ك ل ذ ل ا م و ، DR ر ا ي ت خ ا و ، ب ي ح ر ت ل ل لئ اس ر ل ا ب ق ت س ا و ل اس ر ا ك ل ذ ي ف ا م ب ي د ا ع ال ن م PIM س و ل ه ل ا ع م ت س ت و ، ش ا م ق ل ا ه جاو ل ع ي ب ل س ل ا ع ض و ل ا ي ف ةي دودحل ا ري غ ق ا ر و ال ا ج ر ا ه ظ ا ل " ج ا ر خ ال ا ي ف ةي دودحل ا ري غ ت ا ز ا ج ال ا ر ه ظ ت ن ل . PIM ت ا ي و ه ل س ر ت ال ا ه ن ك ل و دودحل ا ق ا ر و ا IP PIM".

!!!! Border Leaf Node bleaf1 !!!!

```
bleaf1# show ip pim neighbor
```

```
PIM Neighbor information for Dom:common:default
```

Neighbor	Interface	Uptime	Expires	DRPriority
Bidir BFDState				
132.132.132.1/32	tunnel16	06:20:40	00:01:21	1
no n/a				
10.1.20.25/32	eth1/5	06:23:12	00:01:35	1
yes n/a				
10.1.20.1/32	eth1/4	06:23:12	00:01:24	1
yes n/a				

```
bleaf1# show interface tunnel 16
```

```
Tunnel16 is up
  MTU 9000 bytes, BW 0 Kbit
  Transport protocol is in VRF "common:default"
```



```
Tunnel protocol/transport is ipvlan
Tunnel source 131.131.131.1
Tunnel destination 225.1.192.0/32
Last clearing of "show interface" counters never
Tx
0 packets output, 1 minute output rate 0 packets/sec
Rx
0 packets input, 1 minute input rate 0 packets/sec
```

bleaf1#

**!!!! Border Leaf Node bleaf2 !!!!**

bleaf2# show ip pim neighbor

```
PIM Neighbor information for Dom:common:default
Neighbor          Interface          Uptime          Expires          DRPriority
Bidir      BFDState
131.131.131.1/32  tunnel16          06:23:26        00:01:30         1
no          n/a
10.1.20.29/32    eth1/5            06:38:26        00:01:43         1
yes         n/a
10.1.20.5/32    eth1/4            06:38:27        00:01:20         1
yes         n/a
```

bleaf2# show interface tunnel 16

```
Tunnel16 is up
  MTU 9000 bytes, BW 0 Kbit
  Transport protocol is in VRF "common:default"
  Tunnel protocol/transport is ipvlan
  Tunnel source 132.132.132.1
  Tunnel destination 225.1.192.0/32
Last clearing of "show interface" counters never
Tx
0 packets output, 1 minute output rate 0 packets/sec
Rx
0 packets input, 1 minute input rate 0 packets/sec
```

bleaf2#

**!!!! RP !!!!**

bleaf1# show ip pim rp vrf all

```
PIM RP Status Information for VRF:"common:default"
BSR: Not Operational
Auto-RP RPA: 192.168.1.2/32
RP: 99.99.99.99, uptime: 26d21h, expires: 00:02:38,
  priority: 0, RP-source: 192.168.1.2 (A), group-map: None, group ranges:
  224.0.0.0/4
```

bleaf1#

bleaf2# show ip pim rp vrf all

```
PIM RP Status Information for VRF:"common:default"
BSR: Not Operational
Auto-RP RPA: 192.168.1.2/32
RP: 99.99.99.99, uptime: 26d21h, expires: 00:02:38,
  priority: 0, RP-source: 192.168.1.2 (A), group-map: None, group ranges:
  224.0.0.0/4
```

bleaf2#

**!!!! Non border leaf Node !!!!**

cleaf1# show ip pim neighbor

```
PIM Neighbor information for Dom:common:default
Neighbor          Interface          Uptime          Expires          DRPriority
Bidir            BFDState
132.132.132.1/32  tunnel16          06:32:43       00:01:37        1
no               n/a
131.131.131.1/32  tunnel16          06:32:43       00:01:17        1
no               n/a
```

```
cleaf1# show interface tunnel 16
```

```
Tunnel16 is up
  MTU 9000 bytes, BW 0 Kbit
  Transport protocol is in VRF "common:default"
  Tunnel protocol/transport is ipvlan
  Tunnel source 127.0.0.100/32
  Tunnel destination 225.1.192.0/32
  Last clearing of "show interface" counters never
  Tx
  0 packets output, 1 minute output rate 0 packets/sec
  Rx
  0 packets input, 1 minute input rate 0 packets/sec
```

```
cleaf1#
```

```
cleaf2# show ip pim neighbor vrf all
```

```
PIM Neighbor information for Dom:common:default
Neighbor          Interface          Uptime          Expires          DRPriority
Bidir            BFDState
132.132.132.1/32  tunnel16          06:33:17       00:01:33        1
no               n/a
131.131.131.1/32  tunnel16          06:33:17       00:01:41        1
no               n/a
```

```
cleaf2# show interface tunnel 16 Tunnel16 is up MTU 9000 bytes, BW 0 Kbit Transport protocol is
in VRF "common:default" Tunnel protocol/transport is ipvlan Tunnel source 127.0.0.100/32
```

```
Tunnel destination 225.1.192.0/32
  Last clearing of "show interface" counters never
  Tx
  0 packets output, 1 minute output rate 0 packets/sec
  Rx
  0 packets input, 1 minute input rate 0 packets/sec
```

```
cleaf2#
```

```
!!!!!! Core Router !!!!!
```

```
N7K-core-1# show ip pim neighbor
```

```
PIM Neighbor Status for VRF "default"
```

Neighbor	Interface	Uptime	Expires	DR	Priority	Bidir- Capable	BFD State
10.1.20.2	Ethernet1/1	3d22h	00:01:43	1	1	no	n/a
10.1.20.6	Ethernet1/2	3d22h	00:01:36	1	1	no	n/a
10.1.20.10	Ethernet1/3	2w6d	00:01:30	1	1	yes	n/a
10.1.20.14	Ethernet1/4	2w6d	00:01:18	1	1	yes	n/a
10.1.20.42	Ethernet1/5	2w6d	00:01:28	1	1	yes	n/a

```
N7K-core-1#
```

```
N7K-core-2# sh ip pim neighbor
```

```
PIM Neighbor Status for VRF "default"
```

Neighbor	Interface	Uptime	Expires	DR	Priority	Bidir- Capable	BFD State
10.1.20.26	Ethernet1/1	3d22h	00:01:23	1	1	no	n/a
10.1.20.30	Ethernet1/2	3d22h	00:01:17	1	1	no	n/a
10.1.20.18	Ethernet1/3	2w6d	00:01:38	1	1	yes	n/a

10.1.20.22	Ethernet1/4	2w6d	00:01:41	1	yes	n/a
10.1.20.46	Ethernet1/5	2w6d	00:01:17	1	yes	n/a

N7K-core-2#

## دودحل ةقرو نم طشنل ققحتل

نم ادحاو ازئاف APIC راتخت ، ثب ل ددعت م هي جوتل عم ةدحاو دودح ةقرو نم رثكأ ني كمت ةلاح يف حبارل دعيت ل دودحل ةقرو دعيت . ةطشنل دودحل قاروا ةفاك ربع ةعومجم ناو نع لكل طوطخل رورم ةكرح هي جوت ةدعاو ةي نبل نع ةباين PIM تالصلو لاسرل نع ةلوؤسم ةعومجمل ل ططخمل ةي نبل ل ددعت م ل ثب ل .

ل لوصول ةي نك م هل ططخمل زئافل ناك اذا . ني عم ل بكارل ررق ي بورجل ل ططخمل حبارل ، رذجل اب يجرخ لاصلت ططخمل زئافل يدل نكي مل اذا . اضي DF وه ططخمل زئافل ان اف ، رذجل ةي نبل ةهجاو ربع PIM ةلصلو لاسرل قيرط نع DF فلم راتخي اذه BL ذفنم ان اف .

```
!!!! Enter into vsh mode to execute the command !!!!!
bleaf2# vsh
Cisco iNX-OS Debug Shell
This shell should only be used for internal commands and exists
for legacy reasons. User should use ibash infrastructure as this
will be deprecated.
bleaf2# show ip pim internal stripe-winner 228.0.0.1 vrf common:default
PIM Stripe Winner info for VRF "common:default" (BL count: 2)
(*, 228.0.0.1)
BLs: 132.132.132.1 hash: 2081913316 (local)
     131.131.131.1 hash: 1024236260
Winner: 132.132.132.1 best_hash: 2081913316
bleaf2#
bleaf2#
bleaf2# show ip pim internal stripe-winner 229.0.0.1 vrf common:default
PIM Stripe Winner info for VRF "common:default" (BL count: 2)
(*, 229.0.0.1)
BLs: 132.132.132.1 hash: 1595374052 (local)
     131.131.131.1 hash: 2047646436
Winner: 131.131.131.1 best_hash: 2047646436
bleaf2#
```

## عيرسلل براقتل نم ققحتل

```
!!! Verify if fast convergence is enabled
bleaf1# show fabric multicast vrf common:default
Fabric Multicast Enabled VRFs
VRF Name           VRF      Vprime      VN-Seg      VRF      Conv      Tunnel
                   ID       If          ID          Role     Mode     IP
common:default     4        Tunnel16   2162688    BL      Fast     131.131.131.1
bleaf1#
```

!!! None-border leaf

```
cleaf1# show fabric multicast vrf common:default
Fabric Multicast Enabled VRFs
VRF Name           VRF      Vprime      VN-Seg      VRF      Conv      Tunnel
                   ID       If          ID          Role     Mode     IP
common:default     4        Tunnel16   2162688    Leaf    Fast     127.0.0.100
cleaf1#
```

## نم ققحتل IGMP

!!!! bleaf2 receiving IGMP membership join !!!!

bleaf2# show ip igmp groups vrf common:default

Type: S - Static, D - Dynamic, L - Local, T - SSM Translated

Displaying Groups for vrf:common:default

Group Address	Type	Interface	Uptime	Expires	Last Reporter
228.0.0.1	D	vlan25	25d23h	00:02:20	10.90.90.71
229.0.0.1	D	vlan25	25d23h	00:02:24	10.90.90.71
228.0.0.2	D	vlan25	25d23h	00:02:27	10.90.90.72
229.0.0.2	D	vlan25	25d23h	00:02:20	10.90.90.72
228.0.0.3	D	vlan25	25d23h	00:02:25	10.90.90.73
229.0.0.3	D	vlan25	25d23h	00:02:25	10.90.90.73
228.0.0.4	D	vlan25	25d23h	00:02:26	10.90.90.74
229.0.0.4	D	vlan25	25d23h	00:02:25	10.90.90.74
228.0.0.5	D	vlan25	25d23h	00:02:28	10.90.90.75
229.0.0.5	D	vlan25	25d23h	00:02:20	10.90.90.75
228.0.0.6	D	vlan25	25d23h	00:02:22	10.90.90.76
229.0.0.6	D	vlan25	25d23h	00:02:26	10.90.90.76
228.0.0.7	D	vlan25	25d23h	00:02:25	10.90.90.77
229.0.0.7	D	vlan25	25d23h	00:02:19	10.90.90.77
228.0.0.8	D	vlan25	25d23h	00:02:22	10.90.90.78
229.0.0.8	D	vlan25	25d23h	00:02:25	10.90.90.78
228.0.0.9	D	vlan25	25d23h	00:02:27	10.90.90.79
229.0.0.9	D	vlan25	25d23h	00:02:20	10.90.90.79
228.0.0.10	D	vlan25	25d23h	00:02:20	10.90.90.80
229.0.0.10	D	vlan25	25d23h	00:02:21	10.90.90.80

bleaf2#

bleaf2# show ip igmp snooping groups vlan 25

Type: S - Static, D - Dynamic, R - Router port, F - Fabricpath core port

Vlan	Group Address	Ver	Type	Port list
25	*/*	-	R	Vlan25
25	228.0.0.1	v2	D	Eth1/47
25	228.0.0.2	v2	D	Eth1/47
25	228.0.0.3	v2	D	Eth1/47
25	228.0.0.4	v2	D	Eth1/47
25	228.0.0.5	v2	D	Eth1/47
25	228.0.0.6	v2	D	Eth1/47
25	228.0.0.7	v2	D	Eth1/47
25	228.0.0.8	v2	D	Eth1/47
25	228.0.0.9	v2	D	Eth1/47
25	228.0.0.10	v2	D	Eth1/47
25	229.0.0.1	v2	D	Eth1/47
25	229.0.0.2	v2	D	Eth1/47
25	229.0.0.3	v2	D	Eth1/47
25	229.0.0.4	v2	D	Eth1/47
25	229.0.0.5	v2	D	Eth1/47
25	229.0.0.6	v2	D	Eth1/47
25	229.0.0.7	v2	D	Eth1/47
25	229.0.0.8	v2	D	Eth1/47
25	229.0.0.9	v2	D	Eth1/47
25	229.0.0.10	v2	D	Eth1/47

bleaf2#

!!!! cleaf2 receivng IGMP membership join !!!!

cleaf2# show ip igmp groups vrf common:default

Type: S - Static, D - Dynamic, L - Local, T - SSM Translated

Displaying Groups for vrf:common:default

Group Address	Type	Interface	Uptime	Expires	Last Reporter
228.0.0.1	D	vlan9	25d23h	00:03:37	10.32.32.120
228.0.0.1	D	vlan30	25d23h	00:04:17	10.91.91.71
228.0.0.1	D	vlan3	11d23h	00:03:18	10.31.31.123

```

229.0.0.1      D      vlan9      25d23h      00:03:41      10.32.32.121
229.0.0.1      D      vlan30     25d23h      00:02:22      10.91.91.71
229.0.0.1      D      vlan3      11d23h      00:03:16      10.31.31.120
228.0.0.2      D      vlan9      25d23h      00:03:38      10.32.32.123
228.0.0.2      D      vlan30     25d23h      00:02:15      10.91.91.72
228.0.0.2      D      vlan3      11d23h      00:03:16      10.31.31.122
229.0.0.2      D      vlan9      25d23h      00:03:37      10.32.32.123
229.0.0.2      D      vlan30     25d23h      00:02:16      10.91.91.72
229.0.0.2      D      vlan3      11d23h      00:03:16      10.31.31.124
228.0.0.3      D      vlan9      25d23h      00:03:41      10.32.32.120
228.0.0.3      D      vlan30     25d23h      00:04:18      10.91.91.73
228.0.0.3      D      vlan3      11d23h      00:03:18      10.31.31.120
229.0.0.3      D      vlan9      25d23h      00:03:38      10.32.32.121
229.0.0.3      D      vlan30     25d23h      00:04:17      10.91.91.73
229.0.0.3      D      vlan3      11d23h      00:03:18      10.31.31.122
<.....>

```

cleaf2#

cleaf2# show ip igmp snooping vlan 3

IGMP Snooping information for vlan 3

IGMP snooping enabled

Lookup mode: IP

Optimised Multicast Flood (OMF) enabled

IGMP querier present, address: 10.31.31.1, version: 2, i/f Vlan3

Switch-querier disabled

IGMPv3 Explicit tracking enabled

IGMPv2 Fast leave disabled

IGMPv1/v2 Report suppression enabled

IGMPv3 Report suppression enabled

Link Local Groups suppression enabled

Router port detection using PIM Hellos, IGMP Queries

Number of router-ports: 1

Number of groups: 20

VLAN vPC function enabled

Active ports:

Eth1/2      Eth1/3      Po3      Po4

cleaf2# show ip igmp snooping groups vlan 3

Type: S - Static, D - Dynamic, R - Router port, F - Fabricpath core port

Vlan	Group	Address	Ver	Type	Port list
3	*/*		-	R	Vlan3
3	228.0.0.1		v2	D	Po4
3	228.0.0.2		v2	D	Po4
3	228.0.0.3		v2	D	Po4
3	228.0.0.4		v2	D	Po4
3	228.0.0.5		v2	D	Po4
3	228.0.0.6		v2	D	Po4
3	228.0.0.7		v2	D	Po4
3	228.0.0.8		v2	D	Po4
3	228.0.0.9		v2	D	Po4
3	228.0.0.10		v2	D	Po4
3	229.0.0.1		v2	D	Po4
3	229.0.0.2		v2	D	Po4
3	229.0.0.3		v2	D	Po4
3	229.0.0.4		v2	D	Po4
3	229.0.0.5		v2	D	Po4
3	229.0.0.6		v2	D	Po4
3	229.0.0.7		v2	D	Po4
3	229.0.0.8		v2	D	Po4
3	229.0.0.9		v2	D	Po4
3	229.0.0.10		v2	D	Po4

cleaf2#

## MRIB نم ققحتلال

اهراج. قرشابم ةلصتم ددعتم ثب رداصم ىل ع FHR ه ي تال sleaf2 ةيفرطال ةدقعل يوتحت ةدراول ةهجالا 1. يسيرللا دوماعل ي ف 10.0.176.64 وه (RPF) يسكعل راسملا هيجوت ةداعل ي ف PIM. ربع دودحلل ةقرو مادختساب اهيل رظنللا متي يتال (Tunnel16) ةينبلل ةهجالا وه

قاطن لك نم ددعتملا ثبلل دحاو IP ناو نعل ضرورعملل جارخالل نوكي، ةطاسبلل ةبسنلل باق جرخارخال رداصم لل 229.0.0.1 و، ةيلخالل رداصم لل 228.0.0.1: ةومومع

```
!!!! FHR of mcast sources in fabric
sleaf2# show ip mroute vrf common:default
IP Multicast Routing Table for VRF "common:default"

(10.101.101.115/32, 228.0.0.1/32), uptime: 00:17:54, ip pim
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 0)

(10.101.101.116/32, 228.0.0.1/32), uptime: 00:17:54, ip pim
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 0)

(10.101.101.117/32, 228.0.0.1/32), uptime: 00:17:54, ip pim
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 0)

(.....)

(*, 232.0.0.0/8), uptime: 4d00h, pim ip
  Incoming interface: Null, RPF nbr: 0.0.0.0
  Outgoing interface list: (count: 0)

sleaf2# show ip pim neighbor vrf common:default

PIM Neighbor information for Dom:common:default
Neighbor          Interface          Uptime             Expires            DRPriority
Bidir    BFDState
131.131.131.1/32  tunnel16           04:01:06           00:01:23           1
no        n/a
132.132.132.1/32  tunnel16           04:01:06           00:01:32           1
no        n/a
sleaf2#

sleaf2# show interface tunnel 16
Tunnel16 is up
  MTU 9000 bytes, BW 0 Kbit
  Transport protocol is in VRF "common:default"
  Tunnel protocol/transport is ipvlan
  Tunnel source 127.0.0.100/32
  Tunnel destination 225.1.192.0/32
  Last clearing of "show interface" counters never
  Tx
  0 packets output, 1 minute output rate 0 packets/sec
  Rx
  0 packets input, 1 minute input rate 0 packets/sec

sleaf2#
```

CLEAF2 و (101 ةدقعل) CLF1 و (132 ةدقعل) 2 عاقلاب 228.0.0.1 لابقستسإ ةزهجأ لصتتو ةيلخالل لابقستسال ةزهجأ ىل 228.0.0.1 ةومومعملل ىل ثبلل ةداعل Bleaf2 موقت. (102 ةدقعل) ةيساسال ةزهجالل ىل L3out ربع جرخارخال لابقستسال ةزهجالا، 16 قفنللا ربع

!!!!!! Bleaf2 !!!!!

```
bleaf2# show ip mroute 228.0.0.1 vrf common:default
IP Multicast Routing Table for VRF "common:default"
```

```
(* , 228.0.0.1/32), uptime: 3w5d, ngmvpn ip pim igmp
  Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, igmp
    Tunnel16, uptime: 3w5d, ngmvpn
```

```
(10.101.101.115/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.116/32, 228.0.0.1/32), uptime: 3w5d, ip mrib pim ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 3) (Fabric OIF)
    Ethernet1/5, uptime: 00:04:36, pim
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.117/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.118/32, 228.0.0.1/32), uptime: 3w5d, ip mrib pim ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 3) (Fabric OIF)
    Ethernet1/5, uptime: 00:04:36, pim
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.119/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.120/32, 228.0.0.1/32), uptime: 3w5d, mrib ip pim ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.121/32, 228.0.0.1/32), uptime: 3w5d, mrib ip pim ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.122/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 2) (Fabric OIF)
    Vlan25, uptime: 3w5d, mrib
    Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

```
(10.101.101.123/32, 228.0.0.1/32), uptime: 3w5d, ip mrib pim ngmvpn
  Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
```

```
Outgoing interface list: (count: 3) (Fabric OIF)
 Ethernet1/5, uptime: 00:04:36, pim
 Vlan25, uptime: 3w5d, mrib
 Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)

(10.101.101.124/32, 228.0.0.1/32), uptime: 3w5d, ip mrib pim ngmvpn
 Incoming interface: Tunnel16, RPF nbr: 10.0.176.64 (pervasive)
 Outgoing interface list: (count: 3) (Fabric OIF)
 Ethernet1/5, uptime: 1d00h, pim
 Vlan25, uptime: 3w5d, mrib
 Tunnel16, uptime: 3w5d, mrib, ngmvpn, (RPF)
```

bleaf2#

bleaf2# show interface vlan25

```
Vlan25 is up, line protocol is up
 Hardware EtherSVI, address is 0000.0c07.ac5a
 Internet Address is 10.90.90.1/24
 MTU 9000 bytes, BW 10000000 Kbit, DLY 1 usec
  reliability 255/255, txload 1/255, rxload 1/255
 Carrier delay is 10 sec
 Encapsulation ARPA, loopback not set
 Keepalive not supported
 ARP type: ARPA
 Last clearing of "show interface" counters never
 30 seconds input rate 0 bits/sec, 0 packets/sec
 30 seconds output rate 0 bits/sec, 0 packets/sec
 Load-Interval #2: 5 minute (300 seconds)
  input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
 L3 Switched:
  input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
 L3 in Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
 L3 out Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
```

bleaf2#

موقت ال امنك لو L3out. هه جاو ربع جراخ ال ال 228.0.0.1 نم ةومجم هي جوت ةداع اب Bleaf1 موقت  
228.0.0.1 ل ططخم ال ح بار ال تسيل ان ا شح جي سنن ال تاها جاو ربع جي سنن ال ال هي جوت ال ةداع اب

!!!!!! Bleaf1 !!!!!

!!!!!!

bleaf1# show ip mroute 228.0.0.1 vrf common:default  
IP Multicast Routing Table for VRF "common:default"

```
(10.101.101.115/32, 228.0.0.1/32), uptime: 3w4d, mrib ip pim
 Incoming interface: Tunnel14, RPF nbr: 10.0.176.64 (pervasive)
 Outgoing interface list: (count: 1)
 Ethernet1/5, uptime: 1d01h, pim
```

```
(10.101.101.116/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip
 Incoming interface: Tunnel14, RPF nbr: 10.0.176.64 (pervasive)
 Outgoing interface list: (count: 1)
 Ethernet1/4, uptime: 1d01h, pim
```

```
(10.101.101.117/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip
 Incoming interface: Tunnel14, RPF nbr: 10.0.176.64 (pervasive)
 Outgoing interface list: (count: 1)
 Ethernet1/5, uptime: 1d01h, pim
```

```
(10.101.101.118/32, 228.0.0.1/32), uptime: 3w5d, mrib ip pim
```



```

Incoming interface: Tunnell4, RPF nbr: 10.0.176.64 (pervasive)
Outgoing interface list: (count: 1)
  Ethernet1/4, uptime: 1d01h, pim
(10.101.101.119/32, 228.0.0.1/32), uptime: 3w5d, mrib ip pim
  Incoming interface: Tunnell4, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 1)
    Ethernet1/5, uptime: 1d01h, pim
(10.101.101.120/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip
  Incoming interface: Tunnell4, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 1)
    Ethernet1/4, uptime: 1d01h, pim
(10.101.101.121/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip
  Incoming interface: Tunnell4, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 1)
    Ethernet1/4, uptime: 1d01h, pim
(10.101.101.122/32, 228.0.0.1/32), uptime: 1d01h, ip mrib pim
  Incoming interface: Tunnell4, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 1)
    Ethernet1/5, uptime: 1d01h, pim
(10.101.101.123/32, 228.0.0.1/32), uptime: 3w5d, pim mrib ip
  Incoming interface: Tunnell4, RPF nbr: 10.0.176.64 (pervasive)
  Outgoing interface list: (count: 1)
    Ethernet1/4, uptime: 1d01h, pim

```

bleaf1#

ثب ال Bleaf1 ي ق ل ت ت 229.0.0.1 ة ع و م ج م ل ل ط ي ر ش ل ا ة ذ ف ا ن / ة ط ش ن ل ا د و د ج ل ا ة ذ ف ا ن ي ه Bleaf1  
 ة ز ه ج ا ل ل ل ق ت ن ت م ث ، ي ج ر ا خ ل ا ل ي س ي ئ ر ل ا ز ا ه ج ل ا ل ا ل خ ن م 229.0.0.1 ة ع و م ج م ل ا ل ل د د ع ت م ل ا  
 ة ل ح م ل ا ة ك ب ش ل ا ف ر ع م ن ا ظ ح ا ل ) . BD90 ، BD91 ، BD31 ، BD32 ي ف ة ي ل خ ا د ل ا ل ا ب ق ت س ا ل ا  
 ( ر ا ش ت ن ا ل ا ع س ا و G W ه ر ا ب ت ع ا ب ق ر و ل ا ة د ق ع ل ي ل خ ا د ط ق ف و ه ( V L A N ) ة ي ر ه ا ظ ل ا

!!!! bleaf1 !!!!!

```

bleaf1# show ip mroute 229.0.0.1 vrf common:default IP Multicast Routing Table for VRF
"common:default" (*, 229.0.0.1/32), uptime: 3w5d, ngmvpn ip pim Incoming interface: Ethernet1/5,
RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) (Fabric OIF) Tunnell4, uptime: 3w5d,
ngmvpn (10.103.103.40/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/5, RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.41/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/4, RPF nbr: 10.1.20.1 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.42/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/5, RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.43/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/5, RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.44/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/5, RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.45/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/5, RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.46/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/5, RPF nbr: 10.1.20.25 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.47/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/4, RPF nbr: 10.1.20.1 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.48/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:
Ethernet1/4, RPF nbr: 10.1.20.1 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h,
mrib (10.103.103.49/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface:

```

```
Ethernet1/4, RPF nbr: 10.1.20.1 Outgoing interface list: (count: 1) Tunnell4, uptime: 1d01h, mrib bleaf1#
```

```
!!!! bleaf2 !!!!!
```

```
bleaf2# show ip mroute 229.0.0.1 vrf common:default IP Multicast Routing Table for VRF "common:default" (*, 229.0.0.1/32), uptime: 3w5d, ip pim igmp Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5 Outgoing interface list: (count: 1) Vlan25, uptime: 3w5d, igmp (10.103.103.40/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.41/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.42/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.29 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.43/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.29 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.44/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.29 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.45/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.46/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.29 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.47/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.48/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.29 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib (10.103.103.49/32, 229.0.0.1/32), uptime: 1d01h, ip mrib pim Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.5 Outgoing interface list: (count: 1) (Fabric Forwarding Loser) Vlan25, uptime: 1d01h, mrib bleaf2#
```

و BD31 نيزارطال يف لابق تسإة زهجا قافراب نايدودحل الريغ ClearF2 و ClearF1 نازارطال ماق و BD32 و BD91. (S,G) طقف (\*, G) ةيدودحل الريغ ةيفرطال ةدقعل تيبتت معد متي ال.

```
cleaf1# show ip mroute 228.0.0.1 vrf common:default IP Multicast Routing Table for VRF "common:default"
```

```
(*, 228.0.0.1/32), uptime: 3w5d, igmp ip pim Incoming interface: Tunnell4, RPF nbr: 10.0.80.91 Outgoing interface list: (count: 2) Vlan4, uptime: 1w5d, igmp Vlan7, uptime: 3w5d, igmp
```

```
cleaf1# show ip mroute 229.0.0.1 vrf common:default IP Multicast Routing Table for VRF "common:default"
```

```
(*, 229.0.0.1/32), uptime: 3w5d, igmp ip pim Incoming interface: Tunnell4, RPF nbr: 10.0.80.91 Outgoing interface list: (count: 2) Vlan4, uptime: 1w5d, igmp Vlan7, uptime: 3w5d, igmp
```

```
cleaf1#
```

```
cleaf1# show interface vlan 4 Vlan4 is up, line protocol is up Hardware EtherSVI, address is 0000.0c07.ac1f Internet Address is 10.31.31.1/24 MTU 9000 bytes, BW 10000000 Kbit, DLY 1 usec reliability 255/255, txload 1/255, rxload 1/255 Carrier delay is 10 sec
```

```
Encapsulation ARPA, loopback not set
Keepalive not supported
ARP type: ARPA
Last clearing of "show interface" counters never
30 seconds input rate 0 bits/sec, 0 packets/sec
30 seconds output rate 0 bits/sec, 0 packets/sec
Load-Interval #2: 5 minute (300 seconds)
  input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
L3 Switched:
  input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
L3 in Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
L3 out Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
```

```
cleaf1# show interface vlan 7
Vlan7 is up, line protocol is up
Hardware EtherSVI, address is 0000.0c07.ac20
Internet Address is 10.32.32.1/24
MTU 9000 bytes, BW 10000000 Kbit, DLY 1 usec
  reliability 255/255, txload 1/255, rxload 1/255
Carrier delay is 10 sec
Encapsulation ARPA, loopback not set
Keepalive not supported
ARP type: ARPA
Last clearing of "show interface" counters never
30 seconds input rate 0 bits/sec, 0 packets/sec
30 seconds output rate 0 bits/sec, 0 packets/sec
Load-Interval #2: 5 minute (300 seconds)
  input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
L3 Switched:
  input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
L3 in Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
L3 out Switched:
  ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
```

```
cleaf1#
```

!!!! Non-border leaf node has (\*, G) only, (S,G) is not supported.

```
cleaf2# show ip mroute 228.0.0.1 vrf common:default
IP Multicast Routing Table for VRF "common:default"
```

```
(*, 228.0.0.1/32), uptime: 3w5d, igmp ip pim
  Incoming interface: Tunnell6, RPF nbr: 10.0.80.91
  Outgoing interface list: (count: 3)
    Vlan3, uptime: 1w5d, igmp
    Vlan30, uptime: 3w5d, igmp
    Vlan9, uptime: 3w5d, igmp
```

```
cleaf2# show ip mroute 229.0.0.1 vrf common:default
IP Multicast Routing Table for VRF "common:default"
```

```
(*, 229.0.0.1/32), uptime: 3w5d, igmp ip pim
  Incoming interface: Tunnell6, RPF nbr: 10.0.80.91
  Outgoing interface list: (count: 3)
    Vlan3, uptime: 1w5d, igmp
    Vlan30, uptime: 3w5d, igmp
    Vlan9, uptime: 3w5d, igmp
```

```
cleaf2#
```

```
cleaf2# show interface vlan 3
Vlan3 is up, line protocol is up
  Hardware EtherSVI, address is 0000.0c07.ac1f
  Internet Address is 10.31.31.1/24
  MTU 9000 bytes, BW 10000000 Kbit, DLY 1 usec
    reliability 255/255, txload 1/255, rxload 1/255
  Carrier delay is 10 sec
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  ARP type: ARPA
  Last clearing of "show interface" counters never
  30 seconds input rate 0 bits/sec, 0 packets/sec
  30 seconds output rate 0 bits/sec, 0 packets/sec
  Load-Interval #2: 5 minute (300 seconds)
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
  L3 Switched:
    input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
  L3 in Switched:
    ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
  L3 out Switched:
    ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
```

```
cleaf2# show interface vlan 30
Vlan30 is up, line protocol is up
  Hardware EtherSVI, address is 0000.0c07.ac5b
  Internet Address is 10.91.91.1/24
  MTU 9000 bytes, BW 10000000 Kbit, DLY 1 usec
    reliability 255/255, txload 1/255, rxload 1/255
  Carrier delay is 10 sec
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  ARP type: ARPA
  Last clearing of "show interface" counters never
  30 seconds input rate 0 bits/sec, 0 packets/sec
  30 seconds output rate 0 bits/sec, 0 packets/sec
  Load-Interval #2: 5 minute (300 seconds)
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
  L3 Switched:
    input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
  L3 in Switched:
    ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
  L3 out Switched:
    ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
```

```
cleaf2# show interface vlan 9
Vlan9 is up, line protocol is up
  Hardware EtherSVI, address is 0000.0c07.ac20
  Internet Address is 10.32.32.1/24
  MTU 9000 bytes, BW 10000000 Kbit, DLY 1 usec
    reliability 255/255, txload 1/255, rxload 1/255
  Carrier delay is 10 sec
  Encapsulation ARPA, loopback not set
  Keepalive not supported
  ARP type: ARPA
  Last clearing of "show interface" counters never
  30 seconds input rate 0 bits/sec, 0 packets/sec
  30 seconds output rate 0 bits/sec, 0 packets/sec
  Load-Interval #2: 5 minute (300 seconds)
    input rate 0 bps, 0 pps; output rate 0 bps, 0 pps
  L3 Switched:
    input: 0 pkts, 0 bytes - output: 0 pkts, 0 bytes
  L3 in Switched:
    ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes
  L3 out Switched:
```

ucast: 0 pkts, 0 bytes - mcast: 0 pkts, 0 bytes

cleaf2#

ةددعتم تاقفدتلل N7K-core-2 و N7K-core-1 لمح ةكراشم متت ،ةيساسأل اتاهجوم ال يلع موقت ،عيرس ال براقتل اني كم متي مل اذا ، LAN ةكبش نم اهلل لوصحل متي يتل ثبل ا ردصم ال وحن طبرل لاسراب (bleaf1) ةدحاو دودح ةقرو طقف

!!!! Sources in LAN network !!!!

!!!! N7K-core-1 !!!!

N7K-core-1# show ip mroute 229.0.0.1

IP Multicast Routing Table for VRF "default"

(10.103.103.41/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.10  
Outgoing interface list: (count: 1)  
Ethernet1/1, uptime: 1d01h, pim

(10.103.103.42/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42  
Outgoing interface list: (count: 0)

(10.103.103.43/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42  
Outgoing interface list: (count: 0)

(10.103.103.44/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42  
Outgoing interface list: (count: 0)

(10.103.103.46/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42  
Outgoing interface list: (count: 0)

(10.103.103.47/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.14  
Outgoing interface list: (count: 1)  
Ethernet1/1, uptime: 1d01h, pim

(10.103.103.48/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.10  
Outgoing interface list: (count: 1)  
Ethernet1/1, uptime: 1d01h, pim

(10.103.103.49/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip  
Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.10  
Outgoing interface list: (count: 1)  
Ethernet1/1, uptime: 1d01h, pim

N7K-core-1#

!!!! N7K-core-2 !!!!

N7K-core-2# show ip mroute 229.0.0.1

IP Multicast Routing Table for VRF "default"

(\*, 229.0.0.1/32), uptime: 3w5d, pim ip  
Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.46  
Outgoing interface list: (count: 1)  
Ethernet1/1, uptime: 3w5d, pim

```
(10.103.103.40/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.18
  Outgoing interface list: (count: 1)
    Ethernet1/1, uptime: 1d01h, pim

(10.103.103.41/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.22
  Outgoing interface list: (count: 0)

(10.103.103.42/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.18
  Outgoing interface list: (count: 1)
    Ethernet1/1, uptime: 1d01h, pim

(10.103.103.43/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.22
  Outgoing interface list: (count: 1)
    Ethernet1/1, uptime: 1d01h, pim

(10.103.103.44/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.18
  Outgoing interface list: (count: 1)
    Ethernet1/1, uptime: 1d01h, pim

(10.103.103.45/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.22
  Outgoing interface list: (count: 1)
    Ethernet1/1, uptime: 1d01h, pim

(10.103.103.46/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/3, RPF nbr: 10.1.20.18
  Outgoing interface list: (count: 1)
    Ethernet1/1, uptime: 1d01h, pim

(10.103.103.47/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.22
  Outgoing interface list: (count: 0)

(10.103.103.48/32, 229.0.0.1/32), uptime: 00:53:01, pim mrib ip
  Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.46
  Outgoing interface list: (count: 0)

(10.103.103.49/32, 229.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/4, RPF nbr: 10.1.20.22
  Outgoing interface list: (count: 0)
```

N7K-core-2#

!!!!!! Sources in ACI !!!!!

!!!!!! N7K-core-1 !!!!!

N7K-core-1# show ip mroute 228.0.0.1  
IP Multicast Routing Table for VRF "default"

```
(*, 228.0.0.1/32), uptime: 3w5d, pim ip
  Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42
  Outgoing interface list: (count: 2)
    Ethernet1/3, uptime: 3w5d, pim
    Ethernet1/2, uptime: 3w5d, pim
```

```
(10.101.101.115/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.6
```

```
Outgoing interface list: (count: 0)

(10.101.101.116/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.2
  Outgoing interface list: (count: 1)
    Ethernet1/3, uptime: 1d01h, pim

(10.101.101.117/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42
  Outgoing interface list: (count: 0)

(10.101.101.118/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.2
  Outgoing interface list: (count: 1)
    Ethernet1/3, uptime: 1d01h, pim

(10.101.101.119/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.6
  Outgoing interface list: (count: 0)

(10.101.101.120/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.2
  Outgoing interface list: (count: 1)
    Ethernet1/3, uptime: 1d01h, pim

(10.101.101.121/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.2
  Outgoing interface list: (count: 1)
    Ethernet1/3, uptime: 1d01h, pim

(10.101.101.122/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.6
  Outgoing interface list: (count: 0)

(10.101.101.123/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.2
  Outgoing interface list: (count: 1)
    Ethernet1/3, uptime: 1d01h, pim

(10.101.101.124/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.42
  Outgoing interface list: (count: 0)

N7K-core-1#
N7K-core-1#

!!!! N7K-core-2 !!!!
N7K-core-2# show ip mroute 228.0.0.1
IP Multicast Routing Table for VRF "default"

(*, 228.0.0.1/32), uptime: 3w5d, pim ip
  Incoming interface: Ethernet1/5, RPF nbr: 10.1.20.46
  Outgoing interface list: (count: 1)
    Ethernet1/4, uptime: 3w5d, pim

(10.101.101.115/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.26
  Outgoing interface list: (count: 2)
    Ethernet1/4, uptime: 00:02:03, pim
    Ethernet1/3, uptime: 1d01h, pim

(10.101.101.116/32, 228.0.0.1/32), uptime: 00:01:28, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.30
  Outgoing interface list: (count: 1)
```

```
Ethernet1/4, uptime: 00:00:57, pim
(10.101.101.117/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.26
  Outgoing interface list: (count: 2)
    Ethernet1/4, uptime: 00:02:03, pim
    Ethernet1/3, uptime: 1d01h, pim
(10.101.101.118/32, 228.0.0.1/32), uptime: 00:01:28, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.30
  Outgoing interface list: (count: 1)
    Ethernet1/4, uptime: 00:00:57, pim
(10.101.101.119/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.26
  Outgoing interface list: (count: 2)
    Ethernet1/4, uptime: 00:02:03, pim
    Ethernet1/3, uptime: 1d01h, pim
(10.101.101.122/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/1, RPF nbr: 10.1.20.26
  Outgoing interface list: (count: 2)
    Ethernet1/4, uptime: 00:02:03, pim
    Ethernet1/3, uptime: 1d01h, pim
(10.101.101.123/32, 228.0.0.1/32), uptime: 00:01:28, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.30
  Outgoing interface list: (count: 1)
    Ethernet1/4, uptime: 00:00:57, pim
(10.101.101.124/32, 228.0.0.1/32), uptime: 1d01h, pim mrib ip
  Incoming interface: Ethernet1/2, RPF nbr: 10.1.20.30
  Outgoing interface list: (count: 2)
    Ethernet1/3, uptime: 1d01h, pim
    Ethernet1/4, uptime: 1d01h, pim
```

N7K-core-2#

## عجارملا

[ACI 2.0 ل ثبلا ددعتم هي جوتلا](#)



ةمچرتل هذه ل و ح

ةلأل تاي نقتل ن م ة و مچ م ادخت ساب دن تسم ل ا ذه Cisco ت مچرت  
م ل ا ل اء ان ا ع مچ ي ف ن م دخت س م ل ل م عد و ت ح م م ي دقت ل ة ي ر ش ب ل و  
امك ة ق ي ق د ن و ك ت ن ل ة ل ا ة مچرت ل ض ف ا ن ا ة ظ ح ال م ي ج ر ي . ة ص ا خ ل ا 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 ال ا ة مچرت ل ا ع م ل ا ح ل ا و ه  
ل ا ا م اء ا د ع و ج ر ل ا ب ي ص و ت و ت ا مچرت ل ا هذه 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 ت س م ل ا