

# Configure Host-Based routing in ACI

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## Introduction

This document describes Host Based Routing (HBR) feature in ACI.

## Background

The introduction of the Host-Based Routing (HBR) feature after Cisco Application Centric Infrastructure (ACI) release 4.0(1) addresses a primary requirement for supporting host-based routing to achieve optimal routing and symmetric traffic flow. This enhancement significantly simplifies ACI deployment and reduces complexity, making the network more efficient. It is supported on EX, FX, FX2 or later series hardware, which caters to various deployment scenarios including Multi-site, Multi-pod, and inter-VRF/tenant communications. An important advantage of the HBR feature is the cost reduction for deployments, as it eliminates the need for Giant OverLay Forwarding (GOLF) when the requirements are limited to host routing for optimal routing and maintaining L4-L7 traffic symmetry. Configuring the HBR feature within ACI is straightforward and can be accomplished with just a single tick mark, streamlining the process for network administrators.

GOLF is often deployed for Host-Based Routing (HBR) reasons. Still, there is a growing need for Border Leafs (BL) to natively support HBR using routing protocols such as internal BGP (iBGP), external BGP (eBGP), OSPF, and EIGRP. The capability to facilitate native host routing per VRF through iBGP or eBGP, along with full border features, is now a requirement. Border Leafs are expected to handle a significant number of host routes, ranging from 20,000 to 60,000 per Border Leaf. Additionally, there must be the option to control host routing at the bridge domain (BD) level, allowing for the enablement or disablement of this feature, and the ability to download all host routes for a given Bridge Domain (BD) & Virtual Routing and Forwarding (VRF) from the spines. Once configured, the Layer 3 Out (L3-Outs) are responsible for advertising these Host-Routes to the WAN protocols, ensuring connectivity and route dissemination to wider networks.

## How HBR Works

To enable Host-Based Routing (HBR), an administrator must go to the Bridge Domain (BD) settings and

either allow or disable host-routing; this change is then propagated to all the necessary Border Leaves (BLs). Within the network, a Council of Oracle Protocol (COOP) citizen—a component tasked with endpoint information management—learns about Host-Route interests for the BD from the existing configuration. After learning these interests, the COOP citizen then communicates this information to the Spine switches by using the Multicast Route (MRouter) repository.

Endpoint (EP) information, or Host-Routes, are discovered and can be learned at the Border Leaf (BLEAF) where the EP is directly connected, or at a non-border Leaf (Non-BL). These Leaf switches receive EP notifications from the Spine switches, and upon receipt, they update their local COOP EP repositories with the new information.

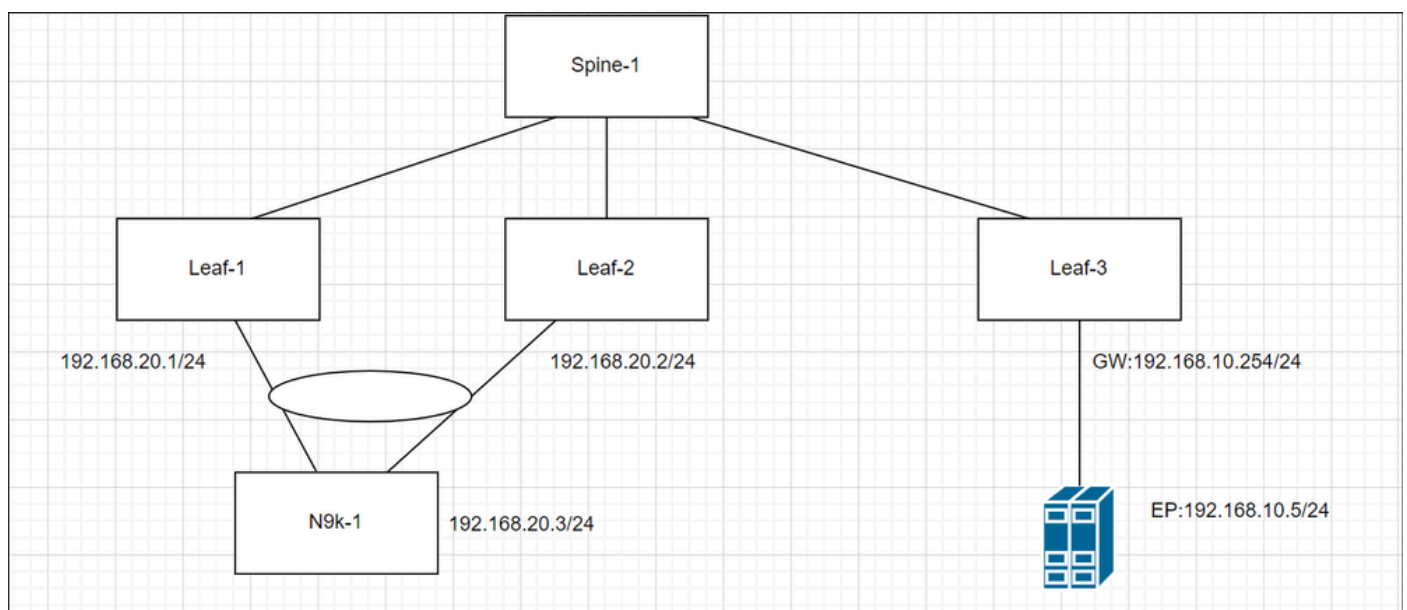
In cases where an EP is located in a remote POD, the COOP does not program the IP into the IP route database (IP\_DB), nor does it pass the route information to the Unified Routing Information Base (URIB). Conversely, local EPs within the same POD as the COOP citizen leak the route to the URIB based on a coop-ripleak route map. However, for EPs that are learned from a remote leaf but still in the same POD, the COOP creates an entry in the IP-DB without leaking this information into the URIB.

The URIB, which is responsible for route handling, does not program these particular routes into the Underlay Forwarding Information Base (UFIB). To ensure a loop-free environment across the network, all dynamic routing protocols such as EIGRP, BGP, and OSPF advertise these Host-Routes with a Transit VRF tag. Lastly, when there is a need to filter the advertisement of routes for any reason, route-maps can be used to provide granular control over which routes are advertised, allowing network administrators to manage the flow of traffic according to specific requirements

## HBR Design Flow

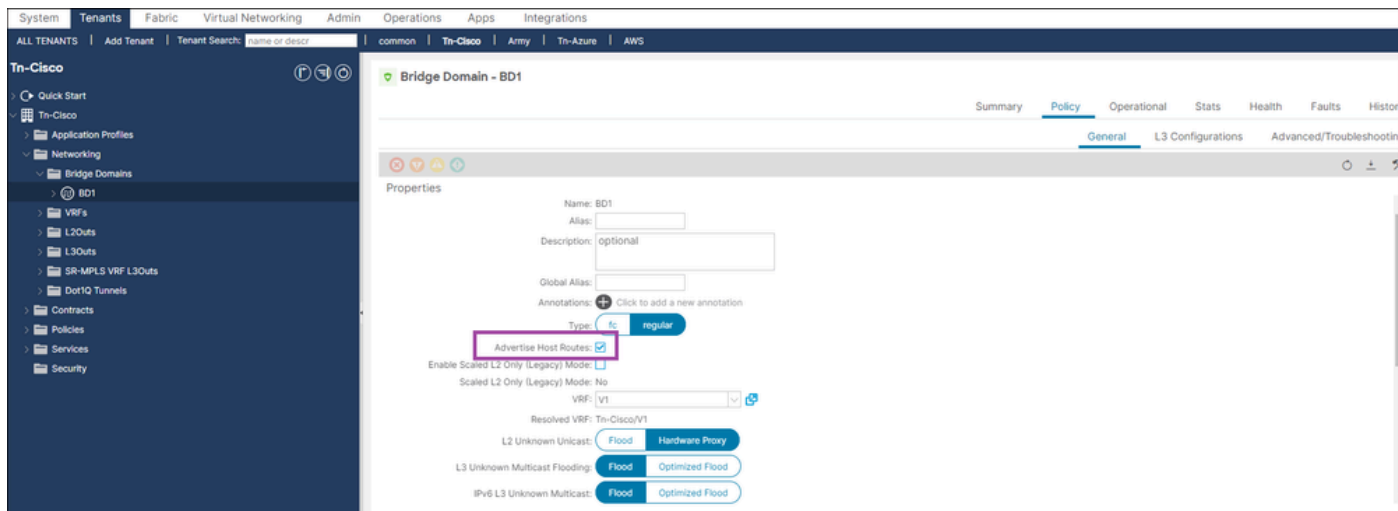
- **Non-Border Leaf behaviour:** It work with normal functionality(no changes), COOP citizen publishes all EP interest to Spines
- **Spine behaviour:** It downloads all the EPs matching host-route to enable BD to BL and BL publishes Host-Route interest for BD.Upon learning a new EP, deleting an existing EP, or moving an EP L2R or R2L, a Host-Route to BL is downloaded

## Lab Topology



# HBR Configuration via GUI

To enable Host-Route , go to **Tenant-->Networking-->Per BD-->Select Advertise Host Routes flag**



## Configuring via CLI

- **Login into APIC CLI**

```
configure terminal
tenant Tn-Cisco
  bridge-domain BD1
    advertise-host-routes
exit
```

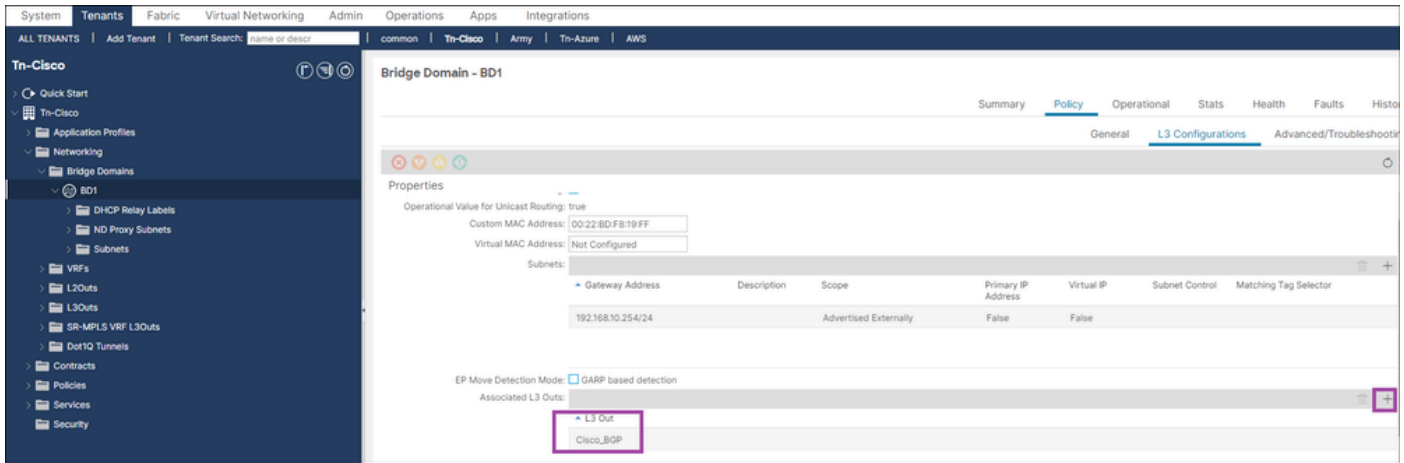
## Two Different methods are available once HBR configured under the BD

- **RSBDto L3out**: Bind L3out with BD subnet to advertise outside
- **Route-map**: Configure explicit route-map and select aggregate flag.

### Method1

**Step 1.** Enable HBR on Per BD level

**Step 2.** Select appropriate **BD-->Click Plus -->associate L3-out**



## HBR Verification via CLI

### 1. Checking EP on Non Border Leaf

```
<#root>
```

```
Leaf3#
```

```
show system internal epm endpoint ip 192.168.10.5
```

```
MAC : a453.0e3d.d9a3 ::: Num IPs : 1
```

```
IP# 0 : 192.168.10.5 ::: IP# 0 flags : host-tracked| ::: l3-sw-hit: Yes ::: flags2 :
```

```
Vlan id : 18 ::: Vlan vnid : 9592 ::: VRF name : Tn-Cisco:V1
```

```
BD vnid : 16580487 ::: VRF vnid : 2359296
```

```
Phy If : 0x1a000000 ::: Tunnel If : 0
```

```
Interface : Ethernet1/1
```

```
Flags : 0x80005c04 ::: sclass : 49154 ::: Ref count : 5
```

```
EP Create Timestamp : 05/29/2024 01:05:28.113231
```

```
EP Update Timestamp : 05/29/2024 03:27:38.093556
```

```
EP Flags : local|IP|MAC|host-tracked|sclass|timer|
```

```
::::
```

### 2. Checking EP (host-route) in Spine (no change in behaviour)

```
<#root>
```

```
Spine1#
```

```
show coop internal info repo ep key 16580487 a453.0e3d.d9a3
```

Repo Hdr Checksum : 37375

Repo Hdr record timestamp : 05 29 2024 02:45:21 470730503

Repo Hdr last pub timestamp : 05 29 2024 02:45:21 472533155

Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0

Repo Hdr dampen penalty : 0

Repo Hdr flags : IN\_OBJ ACTIVE

EP bd vnid : 16580487

EP mac : A4:53:0E:3D:D9:A3

flags : 0x80

repo flags : 0x102

Vrf vnid : 2359296

PcTag : 0x100c002

EVPN Seq no : 0

Remote publish timestamp: 01 01 1970 00:00:00 0

Snapshot timestamp: 05 29 2024 02:45:21 470730503

Tunnel nh : 10.0.32.67

MAC Tunnel : 10.0.32.67

IPv4 Tunnel : 10.0.32.67

IPv6 Tunnel : 10.0.32.67

ETEP Tunnel : 0.0.0.0

num of active ipv4 addresses : 1

num of anycast ipv4 addresses : 0

num of ipv4 addresses : 1

num of active ipv6 addresses : 0

num of anycast ipv6 addresses : 0

num of ipv6 addresses : 0

Primary Path:

Current published TEP : 10.0.32.67

Backup Path:

BackupTunnel nh : 0.0.0.0

Current Backup (publisher\_id): 0.0.0.0  
Anycast\_flags : 0  
Current citizen (publisher\_id): 10.0.32.67  
Previous citizen : 10.0.32.67  
Prev to Previous citizen : 10.0.32.67  
Synthetic Flags : 0x5  
Synthetic Vrf : 243  
Synthetic IP : 30.69.190.5  
Tunnel EP entry: 0x7fd01c015108  
Backup Tunnel EP entry: (nil)  
TX Status: COOP\_TX\_DONE  
Damp penalty: 0  
Damp status: NORMAL  
Leaf 0 Info :  
IPv4 Repo Hdr Checksum : 0  
IPv4 Repo Hdr record timestamp : 05 29 2024 02:45:21 470730503  
IPv4 Repo Hdr last pub timestamp : 05 29 2024 02:45:21 472533155  
IPv4 Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0  
IPv4 Repo Hdr dampen penalty : 0  
IPv4 Repo Hdr flags : IN\_OBJ  
Real IPv4 EP : 192.168.10.5  
Synthetic Flags IPv4 EP : 0x25  
EVPN Seq no : 0  
PcTag: 0x0  
Remote publish timestamp: 01 01 1970 00:00:00 0  
Current publisher\_id: 10.0.32.67  
BackupTunnel nh : 0.0.0.0  
MAC Tunnel : 10.0.32.67  
IPv4 Tunnel : 10.0.32.67  
IPv6 Tunnel : 10.0.32.67  
Current Backup (publisher\_id): 0.0.0.0

Synthetic Vrf IPv4 EP: 164  
Synthetic IP IPV4 EP : 7.84.11.113  
Tunnel EP entry: (nil)  
:Dirty: No  
:Resolved: No  
:Hash: 1152953448 owner: 10.0.32.68

### 3. Checking HBR is enable on BD in BL

<#root>

Leaf1#

show coop internal host-route bridge-domain

Host-Based Routing BD Details:

bd-vnid:16580487, flags:0x1

host-route: Enabled <<<<<<<<

host-route record ts: 05 29 2024 03:21:52 10170968

ep-dnld: Disabled

ep-dnld record ts: 01 01 1970 00:00:00 0

vrf[0]: Tn-Cisco:V1, vnid:2359296 flags:0x1

policy af:IPv4 name:coop-rib1eak-2359296 cfg:1 hd1:152223508 <<<<<<<<

policy af:IPv6 name:coop-rib1eak-2359296 cfg:1 hd1:152224796

### 4. Checking RIB on BL

<#root>

Leaf1#

show ip route vrf Tn-Cisco:V1

<<output omitted>>

192.168.10.0/24, ubest/mbest: 1/0, attached, direct, pervasive

```

    *via 10.0.72.65%overlay-1, [1/0], 00:37:11, static
192.168.10.5/32, ubest/mbest: 1/0, pervasive
    *via , null0, [2/0], 00:12:07, coop, coop, tag 4294967295, redist-only <<<<<<<<
192.168.20.0/24, ubest/mbest: 1/0, attached, direct
    *via 192.168.20.1, vlan7, [0/0], 00:43:03, direct
192.168.20.1/32, ubest/mbest: 1/0, attached
    *via 192.168.20.1, vlan7, [0/0], 00:43:03, local, local

```

## 5. Check Route-map and prefix list on BL

- Since BD is host-route enabled, the Border Leaf switch downloads all the endpoints under the BD via the spine.
- These Eps can include private subnets.
- This route-map and Prefix-lists are used by COOP citizen to decide what routes to leak to URIB

```
<#root>
```

```
Leaf1#
```

```
show route-map | grep coop
```

```

route-map coop-ribreak-2359296, permit, sequence 1 <<<<<<<<
    ip address prefix-lists: IPv4-coop-ribreak-2359296-16580487 <<<<<<<<
route-map coop-ribreak-2359296, deny, sequence 20000
route-map exp-ctx-coop-bgp-2359296, deny, sequence 1
route-map exp-ctx-coop-bgp-2359296, permit, sequence 15801
route-map exp-ctx-coop-bgp-2359296, permit, sequence 15802
route-map exp-ctx-coop-bgp-2359296, permit, sequence 15803
route-map exp-ctx-coop-bgp-2654209, deny, sequence 1
route-map exp-ctx-coop-bgp-2654209, permit, sequence 15801
route-map exp-ctx-coop-bgp-2654209, permit, sequence 15802
route-map exp-ctx-coop-bgp-2654209, permit, sequence 15803

```

```
Leaf1#
```

```
show route-map coop-ribreak-2359296
```

```
route-map coop-ribreak-2359296, permit, sequence 1
```

```
Match clauses:
```



```
ip address prefix-lists: IPv4-coop-ripleak-2359296-16580487
```

```
ipv6 address prefix-lists: IPv6-deny-all
```

```
Set clauses:
```

```
tag 4294967295 <<<<<<<<
```

```
route-map coop-ripleak-2359296, deny, sequence 20000
```

```
Match clauses:
```

```
Set clauses:
```

```
Leaf1#
```

```
show ip prefix-list IPv4-coop-ripleak-2359296-16580487
```

```
ip prefix-list IPv4-coop-ripleak-2359296-16580487: 1 entries
```

```
seq 1 permit 192.168.10.254/24 le 32 <<<<<<<<
```

## 6. Checking HBR Mrouter record in spine

- A COOP Citizen needs to inform the oracle about their interest in hosting a particular route on BD
- In order to do this, the HBR utilizes the existing IGMP Mroutes feature
- The HOST-Route flag is crucial in identifying whether or not a Backbone Leaf (BL) has published a host-route interest for a particular BD-VNID to the Oracle
- The Spine learns about Endpoints (Eps) under BD-VNID and notifies all Host-Route enabled leaves about the Eps under that BD-VNID

```
<#root>
```

```
Spine1#
```

```
show coop internal info repo mrouter
```

```
Repo Hdr Checksum : 32033
```

```
Repo Hdr record timestamp : 05 29 2024 03:40:13 499048910
```

```
Repo Hdr last pub timestamp : 05 29 2024 03:40:13 499250530
```

```
Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0
```

```
Repo Hdr dampen penalty : 0
```

```
Repo Hdr flags : IN_OBJ
```

```
BD Vnid : 16580487
```

```
flags : 0x2
```

```
num of leafs in record : 2
```

num of valid leafs in record : 2

Leaf 0 Info :

Leaf Repo Hdr Checksum : 0

Leaf Repo Hdr record timestamp : 05 29 2024 03:40:13 499048910

Leaf Repo Hdr last pub timestamp : 05 29 2024 03:40:13 499250530

Leaf Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0

Leaf Repo Hdr dampen penalty : 0

Leaf Repo Hdr flags : IN\_OBJ

Leaf tep ip : 10.0.32.66 <<<<<<<<<gives advertising Leaf details

Leaf Flags : 0x2 HOST\_ROUTE <<<<<<<< HBR Flag

Leaf 1 Info :

Leaf Repo Hdr Checksum : 0

Leaf Repo Hdr record timestamp : 05 29 2024 03:36:51 284157681

Leaf Repo Hdr last pub timestamp : 05 29 2024 03:36:51 284372965

Leaf Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0

Leaf Repo Hdr dampen penalty : 0

Leaf Repo Hdr flags : IN\_OBJ

Leaf tep ip : 10.0.32.64

Leaf Flags : 0x2 HOST\_ROUTE

Hash: 2583417566 owner: 10.0.32.65

## 7. Checking EP in BL

<#root>

Leaf1#

```
show coop internal info repo ep key 16580487 a453.0e3d.d9a3
```

MTS RX OK

Next repo refresh: 3430 seconds 71 ms

Repo Hdr Checksum : 0

Repo Hdr record timestamp : 05 29 2024 04:45:21 857613253

Repo Hdr last pub timestamp : 05 29 2024 04:45:21 859299171  
Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0  
Repo Hdr dampen penalty : 0  
Repo Hdr flags : IN\_OBJ ACTIVE <<<<<<<<  
EP bd vnid : 16580487  
EP mac : A4:53:0E:3D:D9:A3  
flags : 0x80  
repo flags : 0x102  
Vrf vnid : 2359296  
PcTag : 0x100c002  
EVPN Seq no : 0  
Remote publish timestamp: 01 01 1970 00:00:00 0  
Snapshot timestamp: 01 01 1970 00:00:00 0  
num of active ipv4 addresses : 1  
num of ipv4 addresses : 1  
num of active ipv6 addresses : 0  
num of ipv6 addresses : 0  
Current citizen (publisher\_id): 10.0.32.67 <<<<<<<<  
Publisher Oracle (Oracle\_id): 10.0.32.65 <<<<<<<<  
Tunnel nh : 10.0.32.67  
RL Tunnel nh : 0.0.0.0  
Dirty : No  
Leaf 0 Info :  
IPv4 Repo Hdr Checksum : 0  
IPv4 Repo Hdr record timestamp : 05 29 2024 04:45:21 857613253  
IPv4 Repo Hdr last pub timestamp : 05 29 2024 04:45:21 859299171  
IPv4 Repo Hdr last dampen timestamp : 01 01 1970 00:00:00 0  
IPv4 Repo Hdr dampen penalty : 0  
IPv4 Repo Hdr flags : IN\_OBJ  
Real IPv4 EP : 192.168.10.5 <<<<<<<<  
Synthetic Flags IPv4 EP : 0

EVPN Seq no : 0  
PcTag: 0x0  
Remote publish timestamp: 01 01 1970 00:00:00 0  
Current publisher\_id: 0.0.0.0  
BackupTunnel nh : 0.0.0.0  
MAC Tunnel : 0.0.0.0  
IPv4 Tunnel : 0.0.0.0  
IPv6 Tunnel : 0.0.0.0  
Current Backup (publisher\_id): 0.0.0.0  
Synthetic Vrf IPv4 EP: 0  
Synthetic IP IPV4 EP : 0.0.0.0  
Tunnel EP entry: (nil)  
:Dirty: No  
:Resolved: No

## 8. Checking IP-DB in BL

<#root>

Leaf1#

show coop internal info ip-db

IP address : 192.168.10.5  
Vrf : 2359296  
Flags : 0x40  
EP bd vnid : 16580487  
EP mac : A4:53:0E:3D:D9:A3  
Record timestamp : 05 29 2024 02:45:21 470730503  
Publish timestamp : 05 29 2024 02:45:21 472533155  
Remote publish timestamp: 01 01 1970 00:00:00 0

## 9. Cheking route in coop-urib in BL

Used for IPv4 and same applicable for IPv6

<#root>

```
Leaf1# show coop internal host-route routes ipv4
```

```
Leaf1# show coop internal host-route routes ipv4
```

Host-Based IPv4 Routing Table for VRF: Tn-Cisco:V1

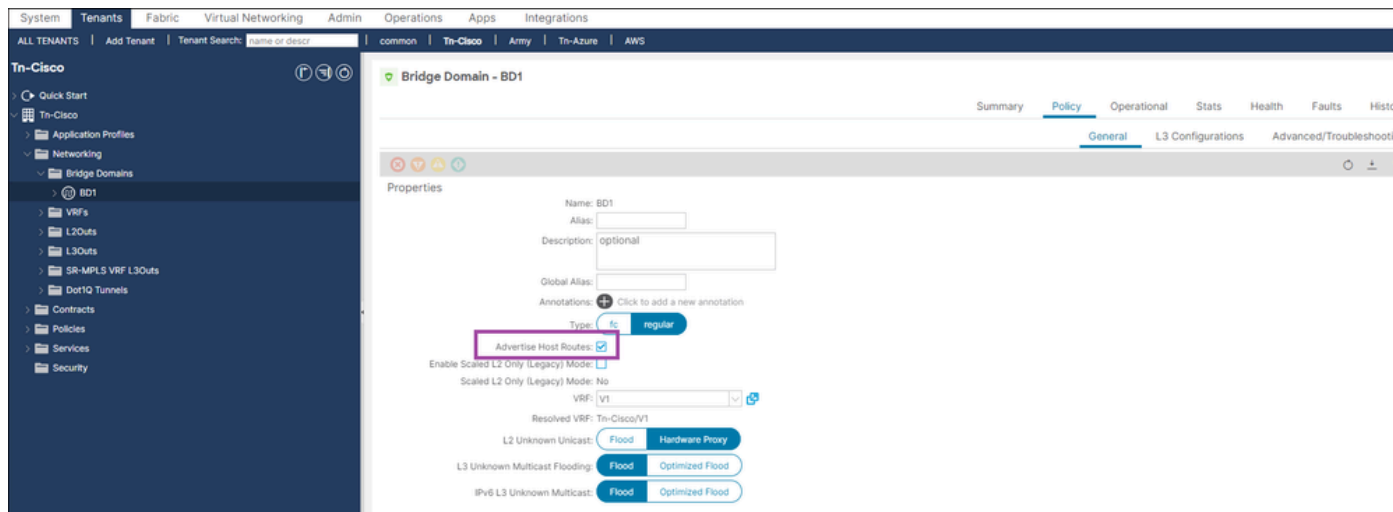
Route, BD-Vnid, Publisher-IP, URIB-Pending

-----  
192.168.10.5, 16580487, 10.0.32.67,  
-----

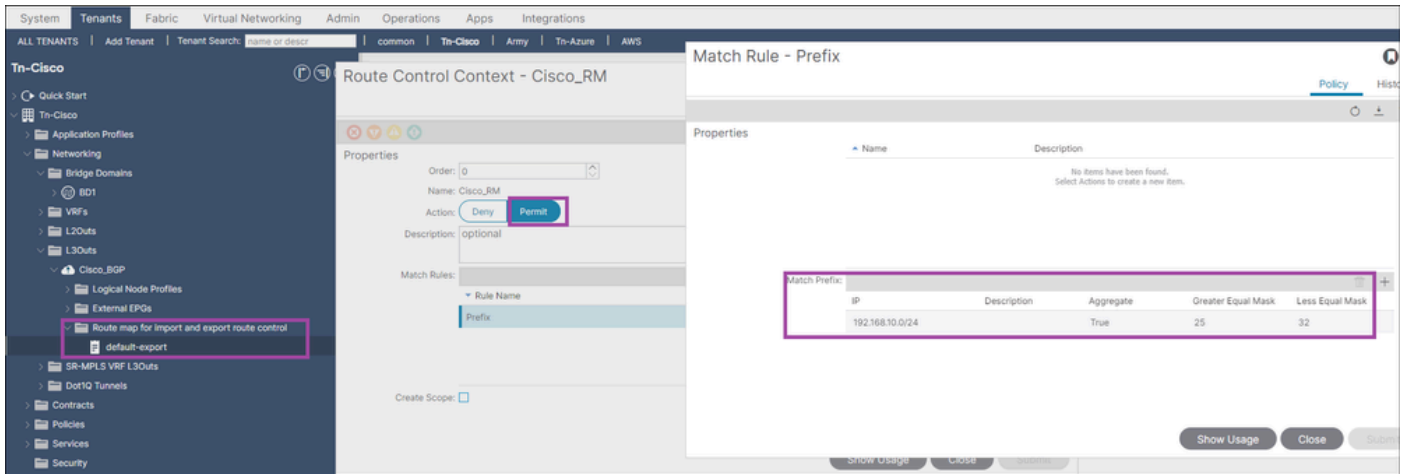
## Method 2

**Step 1.** Enable HBR on Per BD level

**Step 2.** Go to L3-out-->select Route map for import and export route control-->Default-export -->type-->Contexts Plus-->Give name-->Action (permit/Deny)-->Click Plus>Create match Rule for Route Map-->Give Name-->Click Plus-->Match Prefix-->enter IP details-->Select Aggregate



Here is Route-map configuration



## Checking RIB on BL

```
<#root>
```

```
Leaf1#
```

```
show ip route vrf Tn-Cisco:V1
```

```
<<output omitted>>
```

```
192.168.10.0/24, ubest/mbest: 1/0, attached, direct, pervasive
```

```
  *via 10.0.72.65%overlay-1, [1/0], 09:02:17, static
```

```
192.168.10.5/32, ubest/mbest: 1/0, pervasive
```

```
  *via , null0, [2/0], 06:28:06, coop, coop, tag 4294967295, redistrib-only
```

```
192.168.20.0/24, ubest/mbest: 1/0, attached, direct
```

```
  *via 192.168.20.1, vlan7, [0/0], 09:08:09, direct
```

```
192.168.20.1/32, ubest/mbest: 1/0, attached
```

```
  *via 192.168.20.1, vlan7, [0/0], 09:08:09, local, local
```

## Checking on WAN Side

```
<#root>
```

```
Switch1#
```

```
show ip route vrf cisco_BGP
```

```
<<output omitted>>
```

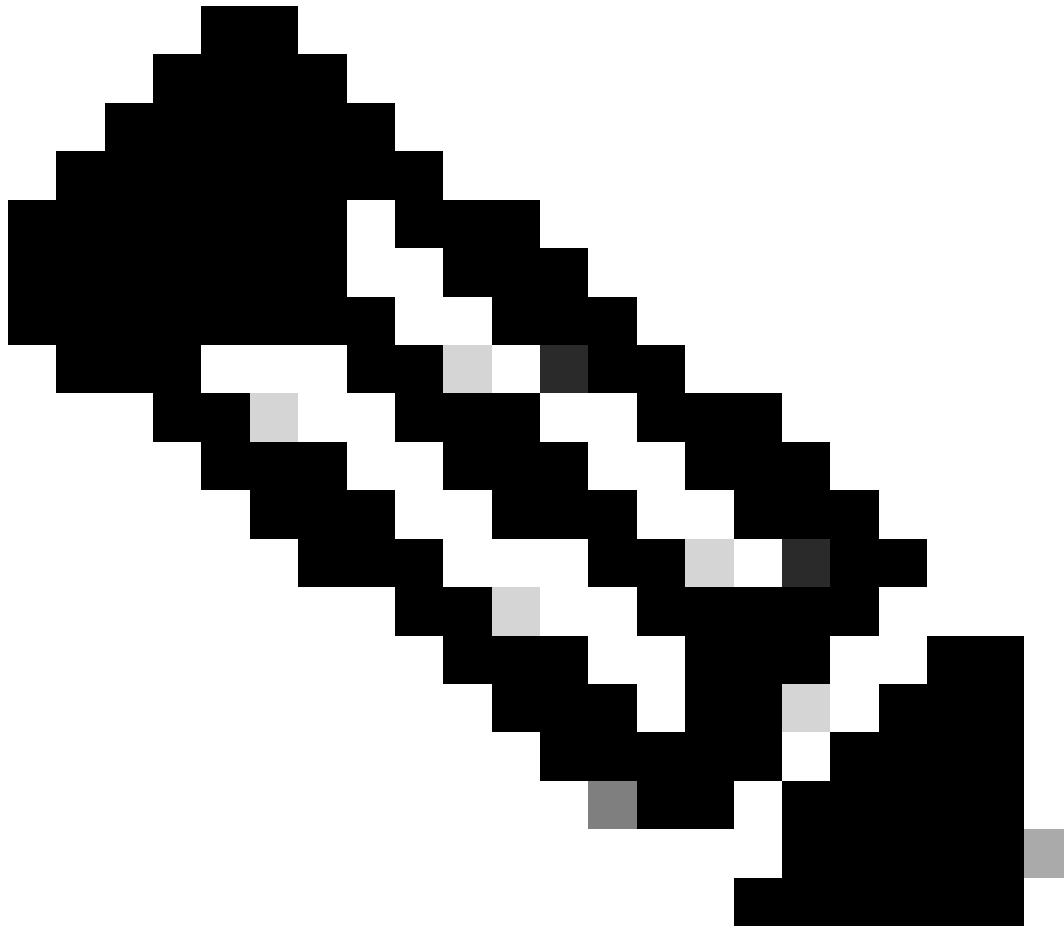
```
192.168.10.5/32, ubest/mbest: 1/0
```

\*via 192.168.20.1, [20/0], 00:02:08, bgp-100, external, tag 65003

192.168.20.0/24, ubest/mbest: 1/0, attached

\*via 192.168.20.3, Vlan20, [0/0], 1d10h, direct

---



**Note:** When custom tag cannot be applied for BD subnet advertised via L3out. This is because, HBR uses loop prevention tag(4294967295).

---

## Verification of HBR using MOs

<#root>

Leaf1#

moquery -c fvBDHolder:

This MO contains Bridge domain-related information and if the Host route is enabled then the "hostBased

# fv.BDHolder

```
bdDn          : uni/tn-Tn-Cisco/BD-BD1
isSvc         : no
bcastP       : 225.0.143.96
childAction   :
descr        :
dn           : bd-[uni/tn-Tn-Cisco/BD-BD1]-isSvc-no
encap        : vxlan-16580487
hostBasedRouting : yes                                <<<<<<<<<
lcOwn        : policy
mcastAllow   : disabled
missingContent : no
modTs        : 2024-05-29T03:21:52.000+00:00
monPolDn     :
name         :
nameAlias    :
ownerKey     :
ownerTag     :
rn          : bd-[uni/tn-Tn-Cisco/BD-BD1]-isSvc-no
status      :
unicastRoute : yes
```

<#root>

apic1#

moquery -c coopBD

: This MO is created from fvBDHolder and it has flag "host-route" to indicate host-routes for that BD n

Total Objects shown: 3



```
# coop.BD
vnid      : 16580487
childAction :
dn        : topology/pod-1/node-101/sys/coop/inst/bd-16580487
flags     : host-route <<<<<<<<HBR enabled on BL
lcOwn     : local
modTs     : 2024-05-29T03:21:52.000+00:00
rn        : bd-16580487
status    :
```

```
# coop.BD
vnid      : 16580487
childAction :
dn        : topology/pod-1/node-102/sys/coop/inst/bd-16580487
flags     : host-route <<<<<<<<HBR enabled on BL
lcOwn     : local
modTs     : 2024-05-29T03:21:51.999+00:00
rn        : bd-16580487
status    :
apic1#
```

<#root>

apic1#

moquery -c coopDom

: This MO contains VRF related

```
# coop.Dom
```

```
name      : Tn-Cisco:V1
addr      : 0.0.0.0
assertFuncName :
assertHit : no
assertLineNo : 0
childAction :
councilMinMaxVersion : unknown
```

```
curVersion      : unknown
dn              : topology/pod-1/node-101/sys/coop/inst/dom-Tn-Cisco:V1
epDamp         : enabled
flags          : host-route          <<<<<<<<
haveDampenedEPs : no
haveThresholdsEPs : no
lastLowerTs     : 1970-01-01T00:00:00.000+00:00
lastLowerVersionAddr : 0.0.0.0
lcOwn          : local
lwepexceptionList : no
lwepnormalList : no
maxVersion     : unknown
minVersion     : unknown
modTs         : 2024-05-29T03:21:52.000+00:00
monPo1Dn      :
noOfDampenedEPs : 0
noOfThresholdEPs : 0
operFlags     :
operSt        : down
operStQual    : unspecified
overloadState  : enabled
rn            : dom-Tn-Cisco:V1
routeTag      : 4294967295
status        :
vniD          : 2359296
```

<#root>

**moquery -c coopRsBD2Dom:**

This Mo can be used to find relation between CoopBD to CoopDom

Total Objects shown: 3

# coop.RsBD2Dom

tDn : topology/pod-1/node-101/sys/coop/inst/dom-Tn-Cisco:V1

```
childAction :
dn          : topology/pod-1/node-101/sys/coop/inst/bd-16580487/rsBD2Dom-[topology/pod-1/node-101/sys/
forceResolve : yes
lcOwn       : local
modTs       : 2024-05-29T05:30:59.960+00:00
rType       : mo
rn          : rsBD2Dom-[topology/pod-1/node-101/sys/coop/inst/dom-Tn-Cisco:V1]
state       : unformed
stateQual   : none
status      :
tCl         : coopDom
tType       : mo
# coop.RsBD2Dom
tDn         : topology/pod-1/node-102/sys/coop/inst/dom-Tn-Cisco:V1
childAction :
dn          : topology/pod-1/node-102/sys/coop/inst/bd-16580487/rsBD2Dom-[topology/pod-1/node-102/sys/
forceResolve : yes
lcOwn       : local
modTs       : 2024-05-29T05:30:59.957+00:00
rType       : mo
rn          : rsBD2Dom-[topology/pod-1/node-102/sys/coop/inst/dom-Tn-Cisco:V1]
state       : unformed
stateQual   : none
status      :
tCl         : coopDom
tType       : mo
# coop.RsBD2Dom
tDn         : topology/pod-1/node-103/sys/coop/inst/dom-Tn-Cisco:V1
childAction :
dn          : topology/pod-1/node-103/sys/coop/inst/bd-16580487/rsBD2Dom-[topology/pod-1/node-103/sys/
forceResolve : yes
```

lcOwn : local  
modTs : 2024-05-29T05:30:59.958+00:00  
rType : mo  
rn : rsBD2Dom-[topology/pod-1/node-103/sys/coop/inst/dom-Tn-Cisco:V1]  
state : unformed  
stateQual : none  
status :  
tCl : coopDom  
tType : mo

<#root>

Leaf1#

moquery -c coopRibLeakP

: This MO controls the routes that must be leaked into RIB

Total Objects shown: 2

# coop.RibLeakP

always : yes

childAction :

dn : sys/coop/inst/dom-Tn-Cisco:V1/af-ipv4-ucast/ribbleak

lcOwn : local

modTs : 2024-05-29T03:21:52.000+00:00

rn : ribbleak

rtMap : coop-ribbleak-2359296

status :

# coop.RibLeakP

always : yes

childAction :

dn : sys/coop/inst/dom-Tn-Cisco:V1/af-ipv6-ucast/ribbleak

lcOwn : local

modTs : 2024-05-29T03:21:52.000+00:00

```
rn          : ribleak
rtMap      : coop-ribleak-2359296
status
```

<#root>

Leaf1#

**moquery -c rtmapRule :**

it gives match and set Rules details from Route-map

# rtmap.Rule

```
name       : exp-l3out-Cisco_BGP-peer-2359296
childAction :
descr      :
dn         : sys/rpm/rtmap-exp-l3out-Cisco_BGP-peer-2359296
lcOwn      : local
modTs      : 2024-05-29T02:53:33.290+00:00
nameAlias  :
rn         : rtmap-exp-l3out-Cisco_BGP-peer-2359296
status     :
```

# rtmap.Rule

```
name       : exp-ctx-coop-bgp-2359296
childAction :
descr      :
dn         : sys/rpm/rtmap-exp-ctx-coop-bgp-2359296
lcOwn      : local
modTs      : 2024-05-29T02:51:07.644+00:00
nameAlias  :
```

<#root>

Leaf1#

**moquery -c rtpfxEntry:**

it gives Prefix related details

```
# rtpfx.Entry
order          : 1
action         : permit
childAction    :
criteria       : inexact
descr          :
dn             : sys/rpm/pfxlist-IPv4-coop-ribreak-2359296-16580487/ent-1
fromPfxLen     : 0
lcOwn          : local
modTs          : 2024-05-29T03:21:52.000+00:00
name           :
nameAlias      :
pfx            : 192.168.10.254/24
rn             : ent-1
rpmCfgFailedBmp :
rpmCfgFailedTs : 00:00:00:00.000
rpmCfgState    : 0
status         :
toPfxLen       : 32
```

<#root>

Leaf1#

**moquery -c bgpInterLeakP:**

This MO is a protocol Route leak policy defining the distribution of routes from one protocol to another

```
# bgp.InterLeakP
```

```
proto         : coop
inst          : default
asn           : 0
childAction    :
descr         :
dn            : sys/bgp/inst/dom-Tn-Cisco:V1/af-ipv4-ucast/interleak-coop-interleak-default
lcOwn         : local
```

modTs : 2024-05-29T02:51:07.644+00:00  
name :  
nameAlias :  
rn : interleak-coop-interleak-default  
rtMap : exp-ctx-coop-bgp-2359296  
scope : inter  
status

## Log location and commands

/var/sysmgr/tmp\_logs/coop\_trace.bl

CPU/Memory Stats

Crash/Core Files.

Output of “top -H” from leaf/spine in case of high cpu

Above Cli outputs and show\_Tech

## Advertise Host Route configuration guidelines and limitations

- If a bridge domain is tied to an EPG that has the same subnet configured for internal leaking, "Advertised Externally" flag on the EPG subnet must be enabled.
- The Advertise Host Routes feature is supported on Generation 2 switches or later (Cisco Nexus N9K switches with "EX", "FX", or "FX2" on the end of the switch model name or later; for example, N9K-93108TC-EX).
- Enabling PIMv4 (Protocol-Independent Multicast, version 4) and Advertise Host routes on a BD is not supported.
- When EPs is aged out or removed from the database, Host routes are withdrawn from the Border Leaf.
- When EP is moved across SITES or PODs, Host routes must be withdrawn from first SITE/POD and advertised in new POD/SITE.
- EPs learned on a specific BD, under any of the BD subnets are advertised from the L3out on the border leaf in the same POD.
- EPs are advertised out as Host Routes only in the local POD through the Border Leaf.
- Host routes are not advertised out from one POD to another POD.
- EPs/Host routes in a Remote Leaf are not advertised out through Border Leaf switches in main POD or another POD.
- EPs/Host routes in the main POD are not advertised through L3out in Remote Leaf switches of same POD or another POD.
- The BD subnet must have the Advertise Externally option enabled.
- The BD must be associated to an L3out or the L3out must have explicit route-map configured matching BD subnets.
- There must be a contract between the EPG in the specified BD and the External EPG for the L3out.