



# Configuring ND Suppression

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## ND Suppression on the Overlay

Multicast Neighbor Solicitation packets from host to another host are flooded over the BGP/EVPN VXLAN Core when hosts are behind two different VXLAN peers.

The ND Suppression cache is built by:

- Snooping NS request in the hosts and populating the ND Suppression cache with source IP and MAC bindings in the request.
- Learning IPv6-Host or MAC address information through BGP EVPN MAC route advertisements.

With ND Suppression, for host to host communication behind two different VXLAN peers, if the remote host is not learned in the suppression cache initially, then NS packets are flooded over the BGP/EVPN VXLAN Core. However, once the ND Suppression cache on a switch S1 is populated with the remote host, any subsequent Neighbor Solicitation request packet for the remote host in the hosts behind S1 are proxied by the Switch S1 thereby preventing the flooding of Neighbor Solicitation packet over the BGP-EVPN/VXLAN core

For ND Suppression cache scale values, see *Cisco Nexus 9000 Series NX-OS Verified Scalability Guide*.

## Guidelines and Limitations for ND Suppression

ND suppression has the following configuration guidelines and limitations:

- Beginning with Cisco NX-OS Release 10.3(1)F, the Cisco Nexus 9300-X Cloud Scale switches supports the ND Suppression feature only on plain BGP EVPN.
- ND Suppression is not supported with BGP-EVPN feature variants like Multisite, Virtual MCT, IRB, Centralized Gateway, Firewall Clustering, vPC.

- For link-local addresses of hosts, ND Suppression is not supported and instead multicast NS for link local address of hosts are flooded over the core of BGP EVPN VXLAN network.
- ND Suppression gets enabled on all VNIs on which suppress-arp is enabled.
- ND Suppression CLI knob must be enabled only under the following conditions:
  - The suppress-arp must be enabled on a VNI and there must be an SVI associated with this VNI/VLAN. Also, this SVI must be in up state and must have both IPv4 and IPv6 address enabled.
  - ND Suppression will not work in the following conditions:
    - If SVI not present for the VLAN/VNI on which suppress-arp/suppress nd is enabled.
    - If SVI associated with VLAN VNI on which suppress-arp/suppress nd is enabled is down.
    - If SVI associated with VLAN/VNI on which suppress-arp/suppress nd is enabled has only IPv4 and no IPv6 address.
    - If SVI associated with VLAN/VNI on which suppress-arp/suppress nd is enabled has only IPv6 and no IPv4 address.

In all the above conditions, host to host traffic can potentially be dropped.
- For ND Suppression VACL to work, increase the SUP TCAM size to 768 or above using the **hardware access-list tcam region sup-tcam 768** command.

## Configuring ND Suppression

This procedure describes how to enable/disable the ND suppression feature on the NVE interface.

### Before you begin

Ensure that ARP suppression is enabled.

### SUMMARY STEPS

1. **configure terminal**
2. **hardware access-list tcam region ing-sup 768**
3. **copy running-config startup-config**
4. **reload**
5. **configure terminal**
6. **interface nve 1**
7. **[no]suppress nd**

### DETAILED STEPS

	Command or Action	Purpose
Step 1	<b>configure terminal</b>  <b>Example:</b> switch# <b>configure terminal</b>	Enters global configuration mode.

	Command or Action	Purpose
Step 2	<b>hardware access-list tcam region ing-sup 768</b> <b>Example:</b> switch# <code>hardware access-list tcam region ing-sup 768</code>	Carves the Ingress SUP TCAM size to 768.
Step 3	<b>copy running-config startup-config</b> <b>Example:</b> switch# <code>copy running-config startup-config</code>	Copies the running configuration to the startup configuration.
Step 4	<b>reload</b> <b>Example:</b> switch# <code>reload</code>	Reloads the switch.
Step 5	<b>configure terminal</b> <b>Example:</b> switch# <code>configure terminal</code>	Enters global configuration mode.
Step 6	<b>interface nve 1</b> <b>Example:</b> switch(config)# <code>interface nve 1</code> switch(config-if-nve)#	Enters interface nve configuration mode.
Step 7	<b>[no]suppress nd</b> <b>Example:</b> switch(config-if-nve)# <code>suppress nd</code>	Configures ND Suppression for all ARP enabled VNIs. Option <b>no</b> disables the ND Suppression for all ARP enabled VNIs.

**Note**

- When global **suppress arp** command is configured, ND Suppression is enabled on all VNIs.
- When global **suppress arp** command is not configured and instead per VNI **suppress arp** command is configured, then ND Suppression is enabled on all VNIs on which ARP suppression is configured.
- When enabling **suppress arp** command on a vPC pair, ensure steps 1-4 on both peers are complete before enabling the feature.

## Verifying the ND Suppression Configuration

To display the ND Suppression configuration information, enter one of the following commands:

Command	Purpose
<code>show run nv overlay</code>	Displays the ND suppression configuration status.

Command	Purpose
<b>show nve vni</b>	Displays whether the ND suppression config has been enabled for ARP enabled VNIs.
<b>show nve internal export nve</b>	Displays whether the ND suppression config has been enabled or not in SDB.
<b>show nve internal export vni</b>	Displays the ND suppression state per VNI in SDB.
<b>show ipv6 nd suppression-cache detail</b> command.	Displays the ICMPv6 cache entries that are present in local.
<b>show ipv6 nd suppression-cache remote</b>	Displays the ICMPv6 cache entries that are present in remote.
<b>show ipv6 nd suppression-cache summary</b>	Displays the IPv6 cache entries summary of both local and remote.
<b>show ipv6 nd suppression-cache statistics</b>	Displays the IPv6 ND suppression cache statistics.
<b>show ipv6 nd suppression-cache vlan "vlan_id"</b>	Displays the details of IPv6 ND Suppression cache entries for a particular VLAN.

The following example shows sample output for the **show run nv overlay** command:

```
switch(config-if-nve)# sh run nv overlay
!Command: show running-config nv overlay
!Running configuration last done at: Sat Mar 19 01:07:49 2022
!Time: Sat Mar 19 01:10:00 2022

version 10.2(3) Bios:version 07.68
feature nv overlay

vlan 101-110,200-203,500-501

interface nve1
 no shutdown
 host-reachability protocol bgp
 suppress nd
 global suppress-arp
```

The following example shows sample output for the **show nve vni** command:

```
switch(config-if-nve-vni)# sh nve vni
Codes: CP - Control Plane      DP - Data Plane
       UC - Unconfigured      SA - Suppress ARP
       S-ND Suppress ND
       SU - Suppress Unknown Unicast
       Xconn - Crossconnect
       MS-IR - Multisite Ingress Replication
       HYB - Hybrid IRB mode

Interface VNI      Multicast-group  State Mode Type [BD/VRF]      Flags
-----
nve1      5000      239.2.0.2      Up   CP   L2 [500]      SA S-ND
```

The following example shows sample output for the **show nve internal export nve** command:

```
switch(config-if-nve-vni)# sh nve internal export nve
```

```
NVE Interface information.
+-----+
Interface: nve1, Admin State: Up,
  State: nve-intf-add-complete, Encap: vxlan
  Source interface: loopback3, VRF: default,
  Anycast-interface: <none>
  Mcast-routing src intf <none>
  Primary IP: 4.4.4.4, Secondary IP: 0.0.0.0,
  VNI-VRF: default, Allow-Src-Lpbk-Down: No,
  Advertise MAC route: No,
  Virtual-rMAC: 0000.0000.0000,
  Mcast-routing Primary IP: 0.0.0.0
  Suppress ND: 1
  Host-reachability: CP
  unknown-peer-forwarding-mode: disable
  VNI assignment mode: n/a
  Multisite bgw-if: <none> (ip: 0.0.0.0, admin/oper state: Down/Down)
  src-node-last-notify: None
  anycast-node-last-notify: None
  mcast-src-node-last-notify: None
  multi-src-node-last-notify: None
+-----+
```

The following example shows sample output for the **show nve internal export vni** command:

```
switch(config-if-nve-vni)# sh nve internal export vni

NVE VNI Information.
+-----+
VNI: 5000 [500] Mgroup: 239.2.0.2 Provision-State: vni-add-complete
  Primary: 4.4.4.4 Secondary: 0.0.0.0 SRC-VRF: default
  Encap: vxlan Repl-mode: Mcast
  Suppress ARP: SP Suppress ND: Enabled Mode: CP, VNI-VRF: <FALSE> [vrf-id 0] [vrf flags
0x0]
  Suppress Unknown-Unicast: FALSE
  X-connect : Disabled
  [VNI local configs] SA : TRUE, Mcast-group : TRUE, IR proto BGP: FALSE
  Config Src: CLI, VNI flags: 0x0
  Spine-AGW: Disabled, HYBRID: Disabled
  Multisite optimized IR: Disabled
  Multisite DCI Group Unknown Address
+-----+
```

The following example shows sample output for the **show ipv6 nd suppression-cache detail** command:

```
switch(config)# show ipv6 nd suppression-cache detail

Flags: + - Adjacencies synced via CFSOE
      L - Local Adjacency
      R - Remote Adjacency
      L2 - Learnt over L2 interface
      PS - Added via L2RIB, Peer Sync
      RO - Dervied from L2RIB Peer Sync Entry

IPv6 Address      Age      Mac Address      Vlan Physical-ifindex  Flags  Remote Vtep
Addr
172:11:1:1::51   00:00:18 acf2.c5f6.7641   11 Ethernet1/51      L
172:11:1:1::201 00:06:14 0000.0011.1111   11 (null)            R      30.100.1.1
172:11:1:1::101 00:06:14 74a0.2f1d.d481   11 (null)            R      10.10.11.11
```

The following example shows sample output for the **show ipv6 nd suppression-cache local** command:

```
switch(config)# show ipv6 nd suppression-cache local

Flags: + - Adjacencies synced via CFSOE
      L - Local Adjacency
      R - Remote Adjacency
      L2 - Learnt over L2 interface

Ip Address      Age      Mac Address      Vlan Physical-ifindex  Flags
172:11:1:1::51  00:00:23 acf2.c5f6.7641   11 Ethernet1/51      L
```

The following example shows sample output for the **show ipv6 nd suppression-cache remote** command:

```
switch(config)# show ipv6 nd suppression-cache remote

Flags: + - Adjacencies synced via CFSOE
      L - Local Adjacency
      R - Remote Adjacency
      L2 - Learnt over L2 interface
      PS - Added via L2RIB, Peer Sync
      RO - Dervied from L2RIB Peer Sync Entry

IPv6 Address      Age      Mac Address      Vlan Physical-ifindex  Flags      Remote Vtep
Addr
172:11:1:1::201  00:06:24 0000.0011.1111   11 (null)          R          30.100.1.1
172:11:1:1::101  00:06:24 74a0.2f1d.d481   11 (null)          R          10.10.11.11
```

The following example shows sample output for the **show ipv6 nd suppression-cache statistics** command:

```
switch(config)# show ipv6 nd suppression-cache statistics

ND packet statistics for suppression-cache

Suppressed:

Total: 1
L3 mode :      Requests 1, Replies 1
              Flood ND Probe 0

Received:
Total: 1
L3 mode:      NS 1, Non-local NA 0
              Non-local NS 0

Mobility Requests:
Total: 0
L3 mode:      Remote-to-local 0, Local-to-remote 0
              Remote-to-remote 0

RARP Signal Refresh: 0

ND suppression-cache Local entry statistics
Adds 3, Deletes 0
```

The following example shows sample output for the **show ipv6 nd suppression-cache summary** command:

```
switch(config)# show ipv6 nd suppression-cache summary

IPV6 ND suppression-cache Summary
Remote          :2
Local          :1
Total          :3
```

The following example shows sample output for the **show ipv6 nd suppression-cache vlan "vlan\_id"** command:

```
switch(config)# show ipv6 nd suppression-cache vlan 11
```

```
Flags: + - Adjacencies synced via CFSOE
```

```
      L - Local Adjacency
```

```
      R - Remote Adjacency
```

```
      L2 - Learnt over L2 interface
```

```
      PS - Added via L2RIB, Peer Sync
```

```
      RO - Dervied from L2RIB Peer Sync Entry
```

IPv6 Address Addr	Age	Mac Address	Vlan	Physical-ifindex	Flags	Remote Vtep
172:11:1:1::51	00:00:40	acf2.c5f6.7641	11	Ethernet1/51	L	
172:11:1:1::201	00:06:36	0000.0011.1111	11	(null)	R	30.100.1.1
172:11:1:1::101	00:06:36	74a0.2f1d.d481	11	(null)	R	10.10.11.11

