Nexus 9000 TCAM values set to 0 dropping Arp, UDLD, LACP packets

Contents

Introduction

This document explains how to troubleshoot when Nexus 9000 TCAM when ports go down due to UDLD error

It cover the current and common concepts, troubleshooting methods and error messages.

The purpose of this document is to help users understand how to troubleshoot TCAM when ports go down due to UDLD error

Prerequsite

Understanding of Cisco NXOS commands

[NXOS TCAM configuration](#)

Topology

The issue can be seen with a simple topology

(N9k-1)Eth2/1-2———————————— (N9k-2) Eth2/1-2

1.1.1.1 /24 1.1.1.2/24

Troubleshooting

Following protocols fail to work on control plane:

ARP resolution fail

Ports on Nexus 9000 reported down due to UDLD error for module 1 & 2.

```
N9K-1(config-if)# 2018 Oct 20 07:23:23 N9K-1 %ETHPORT-5-IF_ADMIN_UP: Interface port-channel100
is admin up .
2018 Oct 20 07:23:23 N9K-1 %ETHPORT-5-IF_DOWN_PORT_CHANNEL_MEMBERS_DOWN: Interface port-
channel100 is down (No operational members)
2018 Oct 20 07:23:23 N9K-1 last message repeated 1 time
2018 Oct 20 07:23:23 N9K-1 %ETHPORT-5-IF_DOWN_ERROR_DISABLED: Interface Ethernet2/2 is down
(Error disabled. Reason:UDLD empty echo)
2018 Oct 20 07:23:23 N9K-1 last message repeated 1 time
2018 Oct 20 07:23:23 N9K-1 %ETHPORT-5-IF_DOWN_ERROR_DISABLED: Interface Ethernet2/1 is down
(Error disabled. Reason:UDLD empty echo)
sh 2018 Oct 20 07:23:25 N9K-1 last message repeated 1 time
```

Line cards fail due to **L2ACLRedirect** diagnostic test on chassis for module 1 & 2.

```
'Show module'

Mod  Online Diag Status
---  ------------------
1    Fail————————————cleared the module 1 and 2 error .[show logging nvram]
2    Fail————————————module 2 reloaded.
3    Pass

Module 1 and 2:

                11) L2ACLRedirect-----------------> E
                12) BootupPortLoopback: U
```

Another Possible way customer can hit this state is SUP/LC from a T2 ASIC based chassis moved to Tahoe based chassis

Note: If you want to know more information about ASIC troubleshooting please contact cisco TAC

CSCvc36411 Upgrading from T2 to Tahoe based line cards / FM can cause diagnostic failure and TCAM issues

Analysis

This issue would be seen when TCAM Values set to 0 on N9K-2

```
'Show module'

Mod  Online Diag Status
---  ------------------
1    Fail————————————cleared the module 1 and 2 error .[show logging nvram]
2    Fail————————————module 2 reloaded.
3    Pass

Module 1 and 2:

                11) L2ACLRedirect-----------------> E
                12) BootupPortLoopback: U
```

To islolate further remove UDLD and but ping fail to work

Arp request going out of N9K-2

```
N9K-2# ethanalyzer local interface inband

Capturing on inband
2018-10-23 10:46:47.282551      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:47.286072 b0:aa:77:30:75:bf -> ff:ff:ff:ff:ff:ff ARP Who has 1.1.1.1?  Tell
1.1.1.2
2018-10-23 10:46:49.284704      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:51.286150 b0:aa:77:30:75:bf -> ff:ff:ff:ff:ff:ff ARP Who has 1.1.1.1?  Tell
1.1.1.2
2018-10-23 10:46:51.286802      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:53.288989      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:55.289920      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:57.292070      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:59.292568      1.1.1.1 -> 1.1.1.2      ICMP Echo (ping) request
2018-10-23 10:46:59.292818 b0:aa:77:30:75:bf -> ff:ff:ff:ff:ff:ff ARP Who has 1.1.1.1?  Tell
1.1.1.2
10 packets captured
```

N9K-1# ethanalyzer local interface inband

```
Capturing on inband
2018-10-23 04:02:40.568119 b0:aa:77:30:75:bf -> ff:ff:ff:ff:ff:ff ARP Who has 1.1.1.1?  Tell
1.1.1.2
2018-10-23 04:02:40.568558 cc:46:d6:af:ff:bf -> b0:aa:77:30:75:bf ARP 1.1.1.1 is at
cc:46:d6:af:ff:bf
2018-10-23 04:02:48.574800 b0:aa:77:30:75:bf -> ff:ff:ff:ff:ff:ff ARP Who has 1.1.1.1?  Tell
1.1.1.2
2018-10-23 04:02:48.575230 cc:46:d6:af:ff:bf -> b0:aa:77:30:75:bf ARP 1.1.1.1 is at
cc:46:d6:af:ff:bf———arp reply packet sent by agg1.
```

ELAM on N9K-2 has ARP response from N9K-1

Note: Please contact Cisco TAC to verify ELAM capture

```
module-2(TAH-elam-insel6)# reprort

Initting block addresses

SUGARBOWL ELAM REPORT SUMMARY

slot - 2, asic - 1, slice - 0
============================

Incoming Interface: Eth2/2
Src Idx : 0x42, Src BD : 4489
Outgoing Interface Info: dmod 0, dpid 0
Dst Idx : 0x0, Dst BD : 4489

Packet Type: ARP

Dst MAC address: B0:AA:77:30:75:BF
Src MAC address: CC:46:D6:AF:FF:BF
Target Hardware address: B0:AA:77:30:75:BF ------------------------------------ Arp packet
captured on Linecard
Sender Hardware address: CC:46:D6:AF:FF:BF
Target Protocol address: 1.1.1.2
```

Sender Protocol address: 1.1.1.1
ARP opcode: 2

Drop Info:
module-2(TAH-elam-insel6)#

Bug ping still fail

```
module-2(TAH-elam-insel6)# reprort

Initting block addresses

SUGARBOWL ELAM REPORT SUMMARY

slot - 2, asic - 1, slice - 0
============================

Incoming Interface: Eth2/2
Src Idx : 0x42, Src BD : 4489
Outgoing Interface Info: dmod 0, dpid 0
Dst Idx : 0x0, Dst BD : 4489

Packet Type: ARP

Dst MAC address: B0:AA:77:30:75:BF
Src MAC address: CC:46:D6:AF:FF:BF
Target Hardware address: B0:AA:77:30:75:BF ------------------------------------- Arp packet
captured on Linecard
Sender Hardware address: CC:46:D6:AF:FF:BF
Target Protocol address: 1.1.1.2
Sender Protocol address: 1.1.1.1
ARP opcode: 2

Drop Info:
module-2(TAH-elam-insel6)#

module-2(TAH-elam-insel6)# reprort

Initting block addresses

SUGARBOWL ELAM REPORT SUMMARY

slot - 2, asic - 1, slice - 0
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Incoming Interface: Eth2/2
Src Idx : 0x42, Src BD : 4489
Outgoing Interface Info: dmod 0, dpid 0
Dst Idx : 0x0, Dst BD : 4489

Packet Type: ARP

Dst MAC address: B0:AA:77:30:75:BF
Src MAC address: CC:46:D6:AF:FF:BF
Target Hardware address: B0:AA:77:30:75:BF ------------------------------------- Arp packet
captured on Linecard
Sender Hardware address: CC:46:D6:AF:FF:BF
Target Protocol address: 1.1.1.2
Sender Protocol address: 1.1.1.1
ARP opcode: 2

Drop Info:
module-2(TAH-elam-insel6)#
```

To isolate arp issue add a static arp entry and disable UDLD

After static arp ping from 1.1.1.2 to 1.1.1.1 started working but it would fail again if UDLD is enabled

```
module-2(TAH-elam-insel6)# reprort

Initting block addresses

SUGARBOWL ELAM REPORT SUMMARY

slot - 2, asic - 1, slice - 0
============================

Incoming Interface: Eth2/2
Src Idx : 0x42, Src BD : 4489
Outgoing Interface Info: dmod 0, dpid 0
Dst Idx : 0x0, Dst BD : 4489

Packet Type: ARP

Dst MAC address: B0:AA:77:30:75:BF
Src MAC address: CC:46:D6:AF:FF:BF
Target Hardware address: B0:AA:77:30:75:BF ------------------------------------- Arp packet
captured on Linecard
Sender Hardware address: CC:46:D6:AF:FF:BF
Target Protocol address: 1.1.1.2
Sender Protocol address: 1.1.1.1
ARP opcode: 2

Drop Info:
module-2(TAH-elam-insel6)#
```

Though ping works the UDLD errors would still be seen on the interface when enabled

No CoPP drops as seen below

```
module-2(TAH-elam-insel6)# reprort

Initting block addresses

SUGARBOWL ELAM REPORT SUMMARY

slot - 2, asic - 1, slice - 0
============================

Incoming Interface: Eth2/2
Src Idx : 0x42, Src BD : 4489
Outgoing Interface Info: dmod 0, dpid 0
Dst Idx : 0x0, Dst BD : 4489

Packet Type: ARP

Dst MAC address: B0:AA:77:30:75:BF
Src MAC address: CC:46:D6:AF:FF:BF
Target Hardware address: B0:AA:77:30:75:BF ------------------------------------- Arp packet
captured on Linecard
Sender Hardware address: CC:46:D6:AF:FF:BF
Target Protocol address: 1.1.1.2
Sender Protocol address: 1.1.1.1
```

```
ARP opcode: 2

Drop Info:
module-2(TAH-elam-insel6)#
```

Spoiler

Active FM towards Sup is Module 22. Toverify run below commands

```
module-30# show mvdxn internal port-status

Switch type: Marvell 98DXN41 - 4 port switch
Port  Descr               Enable  Status  ANeg  Speed  Mode   InByte    OutByte     InPkts
OutPkts
--  --------------------  ------  ------  ----  -----  ---- ---------- ---------- ---------- ---
-------
6         Local AXP CPU     Yes      UP   No      2     6   781502852 1006219901    6868852
3506128
7  This SC BCM EOBC switch     Yes      UP   No      2     6   654791960  430206276    1833465
  3523170
8  Other SC BCM EOBC switch     Yes    DOWN   No      2     6       72282        176          3
        2
9    This SC EPC switch     Yes      UP   No      2     6   351355874  351309506    1672662
3345683

Switch type: Marvell 98DXN11 - 10 port switch
Port  Descr               Enable  Status  ANeg  Speed  Mode   InByte    OutByte     InPkts
OutPkts
--  --------------------  ------  ------  ----  -----  ---- ---------- ---------- ---------- ---
-------
0        FM6 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
1        FM5 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
2           SUP ALT EPC     Yes    DOWN   No      2     6           0          0          0
    0
3           SUP PRI EPC     Yes    DOWN   No      2     6           0          0          0
    0
4        FM4 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
5        FM3 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
6        FM2 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
7        FM1 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
8   Other SC EPC switch     Yes      UP   No      2     6   351356399  351310095    1672664
3345687
9  Local SC 4-port switch     Yes      UP   No      2     6   351310031  351356399    3345688
1672664

Rule  Rule_name             Match_ctr             Pol_en  Pol_idx  inProfileBytes
outOfProfileBytes

----  --------------------  --------------------  ------  -------  --------------------  -------
-------------
```

Active FM towards Sup is Module 22. Toverify run below commands module-30# show mvdxn internal port-statusSwitch type: Marvell 98DXN41 - 4 port switchPort Descr Enable Status ANeg Speed Mode InByte OutByte InPkts OutPkts-- -------------------- ------ ------ -

--- ----- ---- ---------- ---------- ---------- ---------- 6 Local AXP CPU Yes UP No 2 6 781502852 1006219901 6868852 3506128 7 This SC BCM EOBC switch Yes UP No 2 6 654791960 430206276 1833465 3523170 8 Other SC BCM EOBC switch Yes DOWN No 2 6 72282 176 3 2 9 This SC EPC switch Yes UP No 2 6 351355874 351309506 1672662 3345683Switch type: Marvell 98DXN11 - 10 port switchPort Descr Enable Status ANeg Speed Mode InByte OutByte InPkts OutPkts-- ---------- ------ ------ ---- ----- ---- ---------- ---------- ---------- ---------- 0 FM6 EPC switch Yes DOWN No 2 6 0 0 0 0 1 FM5 EPC switch Yes DOWN No 2 6 0 0 0 0 2 SUP ALT EPC Yes DOWN No 2 6 0 0 0 0 3 SUP PRI EPC Yes DOWN No 2 6 0 0 0 0 4 FM4 EPC switch Yes DOWN No 2 6 0 0 0 0 5 FM3 EPC switch Yes DOWN No 2 6 0 0 0 0 6 FM2 EPC switch Yes DOWN No 2 6 0 0 0 0 7 FM1 EPC switch Yes DOWN No 2 6 0 0 0 0 8 Other SC EPC switch Yes UP No 2 6 351356399 351310095 1672664 3345687 9 Local SC 4-port switch Yes UP No 2 6 351310031 351356399 3345688 1672664Rule Rule_name Match_ctr Pol_en Pol_idx inProfileBytes outOfProfileBytes---- ---------- ---------- ------ ------- ---------- ----------

Solution

TCAM Values set to 0 cause dropping of all control traffic in the linecard .

After changing the TCAM values to the default udld comes up and arp gets resolved

Configuration added to N9K-2 to solve the issue

Reload is needed after the configration change

module-30# show mvdxn internal port-status

```
Switch type: Marvell 98DXN41 - 4 port switch
Port  Descr               Enable  Status  ANeg  Speed  Mode   InByte    OutByte     InPkts
OutPkts
--  --------------------  ------  ------  ----  -----  ---- ---------- ---------- ---------- ---
-------
6         Local AXP CPU     Yes      UP   No      2     6   781502852 1006219901    6868852
3506128
7  This SC BCM EOBC switch     Yes      UP   No      2     6   654791960  430206276    1833465
  3523170
8  Other SC BCM EOBC switch     Yes    DOWN   No      2     6       72282        176          3
        2
9    This SC EPC switch     Yes      UP   No      2     6   351355874  351309506    1672662
3345683

Switch type: Marvell 98DXN11 - 10 port switch
Port  Descr               Enable  Status  ANeg  Speed  Mode   InByte    OutByte     InPkts
OutPkts
--  --------------------  ------  ------  ----  -----  ---- ---------- ---------- ---------- ---
-------
0        FM6 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
1        FM5 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
```

```
2           SUP ALT EPC     Yes    DOWN   No      2     6           0          0          0
    0
3           SUP PRI EPC     Yes    DOWN   No      2     6           0          0          0
    0
4        FM4 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
5        FM3 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
6        FM2 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
7        FM1 EPC switch     Yes    DOWN   No      2     6           0          0          0
    0
8   Other SC EPC switch     Yes      UP   No      2     6   351356399  351310095    1672664
3345687
9  Local SC 4-port switch     Yes      UP   No      2     6   351310031  351356399    3345688
1672664

Rule  Rule_name            Match_ctr            Pol_en  Pol_idx  inProfileBytes
outOfProfileBytes

----  -------------------  -------------------  ------  -------  -------------------  -------
-------------
```

Useful commands

Show hardware access-list tcam region

Show run | inc TCAM"-----No output means TCAM is set to default settings.

Useful links

[Nexus 9000 TCAM Carving]