

نقحلا/مزحلا ،لقنلا) ةمزحلا رمع :NCS5500 (لاصتالا رابتخا راسم

تايوتحمل

ةمدقملا

هيجوتلا ةداعلا ASIC في ةمزحلا رمع

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[ةدحو يلا \(LC\) ةيزك رمل ةجلاعمل ةدحو بصاخلا \(CPU\) ةيزك رمل ةجلاعمل ةدحو نم راسم لاخدا \(NPU\) ةيزك رمل ةجلاعمل](#)

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[tx \(LC\): ةديعبلا ةدقعلا :دادترالا در](#)

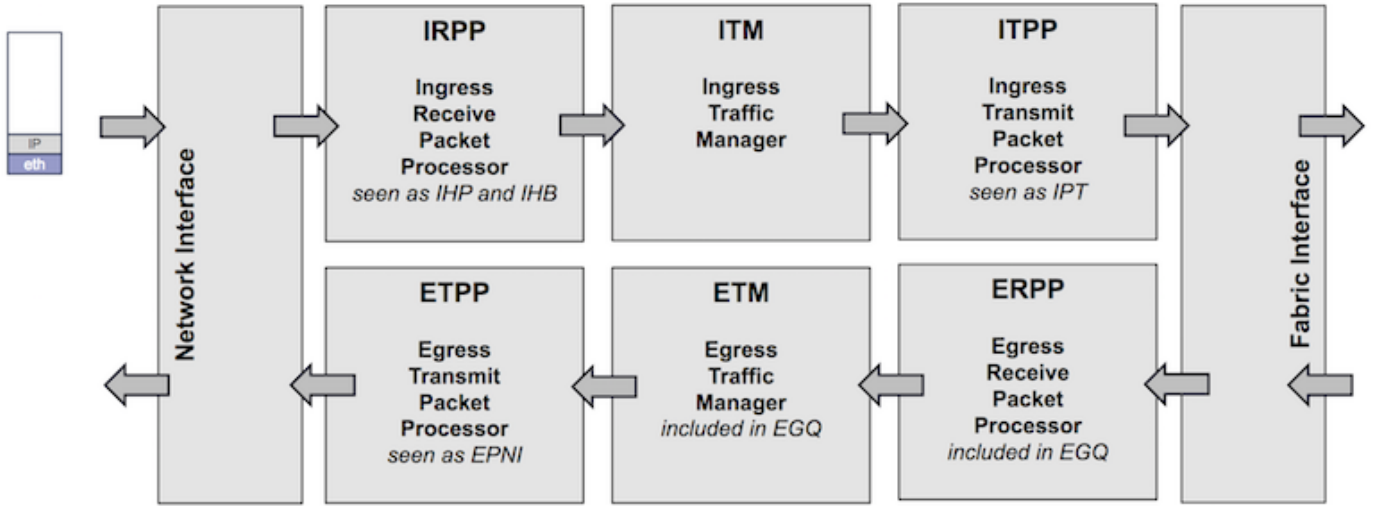
[Rx \(LC\): ةيحمل ةدقعلا :دادترالا در](#)

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ةمدقملا

لخاد Echo يلع بلطلا/ICMP Echo يلع درلا مزح هكلس ت يذلا راسملا دنتسملا اذه فصوي
(NCS55xx(fretta) ع برم

هيجوتلا ةداعلا ASIC في ةمزحلا رمع



بېرې

اهتجال عام و تېاب 128 لوأ چارختسإ متي شيح IRPP ىلإ اهريرمتو ةهچاوىل ع ةمزح يقلت متي اقېسم يلىخادلا ماظنل سار دادعإ مت، كذلذ ةحيتنو.

ITM

ف ةمزحل نيزخت متي DRAM/OCB

ITPP

ذفنم ل ساكعناو ددعتم ل شبل ل لثامتم ل خسنل) ماظنل سار ةباتك ةداعإ م رمأل مزل اذا (كلذلى امو

ةينبل لىل لىمحتل ةنزاوم متي و اىال خ لىل مزحل ميسقت متي

بېرې

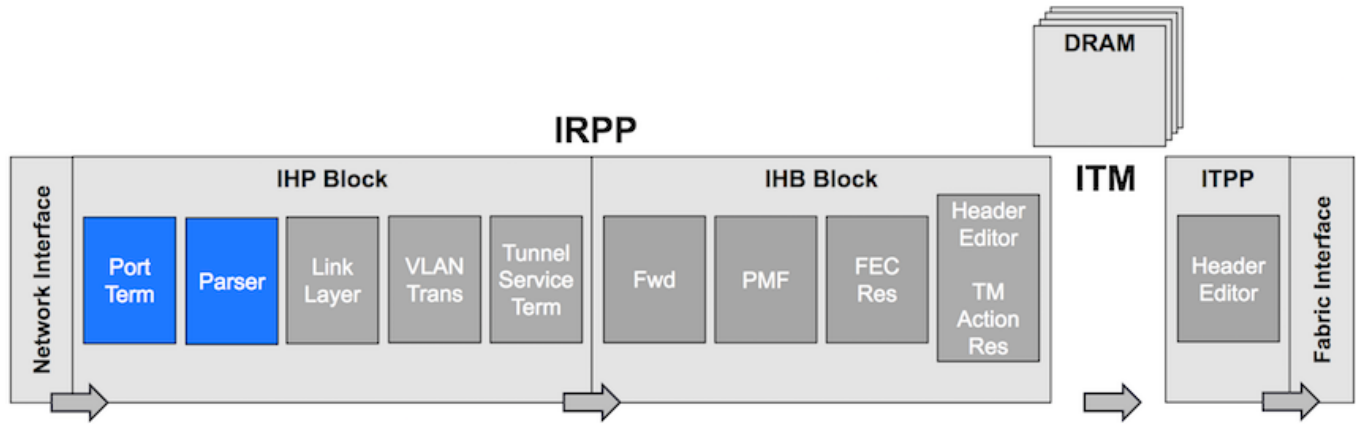
لماوع عيمج قېببطو تېاب 128 لوأ چارختسإ متي. اهعيمجت ةداعإ و اىال خ لىل يقلت متي جورخل ل لثامتم ل خسنل او جورخل ل لوصول اى ف مكحتل مئاقوقو طابترال ةقبط ةيفصت (ددعتم ل شبل)

ETPP/ETM

سوؤر ةلازا تم. ةمزحل جورخ ةلودج متت ىحت تقؤم نزم ي ف لمالكاب ةمزحل نيزخت متي ماظنل.

تاقفدتل اهيچوت ةداعإ ASIC

(لحلحمل، ذفنم ل حلطصم) IRPP

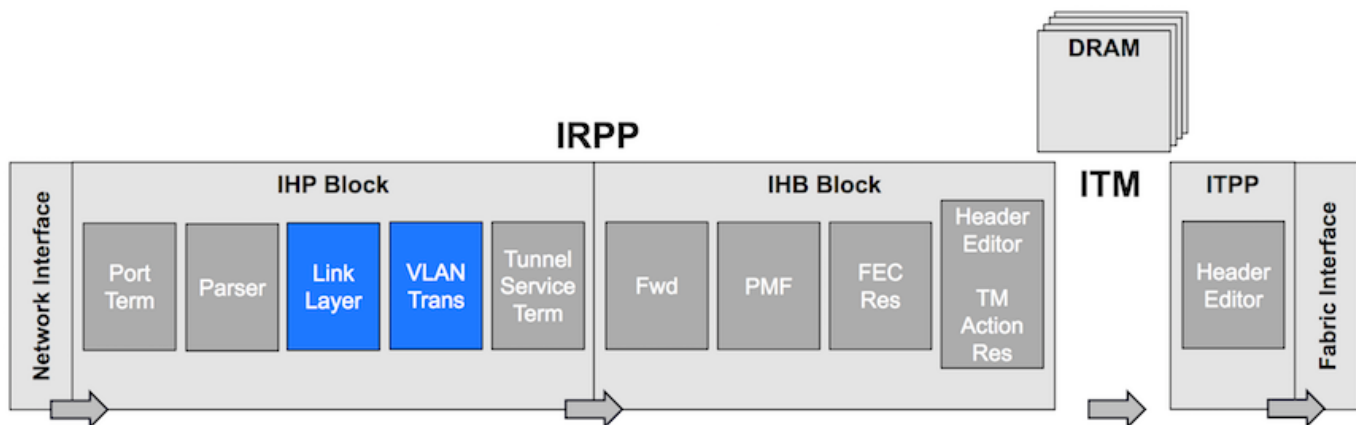


باسحلا ةداع/ةيزكرملا ةجلاعمل ةدحو/ةكبشلا ةهجاو نم ةمלטسملا مزحلا: ذفنملا ءاهن

- هعم ةمزحلا ىلع ةمالع عضوو رصملا ذفنم دح.
- Parser يف همادختسا متيس يذلا يلوألا جم انربلا دح.
- ةكبشلا سارءب ناكم دح.

تاقفدتلا يف ةيولاتلا لحارملا ةجازا دح، MAC نيوانع، EtherType جارختسا: لالحملا

IRPP (VLAN تالوحتم، طخلا ةقبط)



ردصملا ناوئع ةقداصم و L2 ىلع ةيفصتلا: طابترالا ةقبط.

ةمزحلا ةيقتنملا ةطيخلا مسرن نحن: ةمچرت VLAN.

بقثم راسم

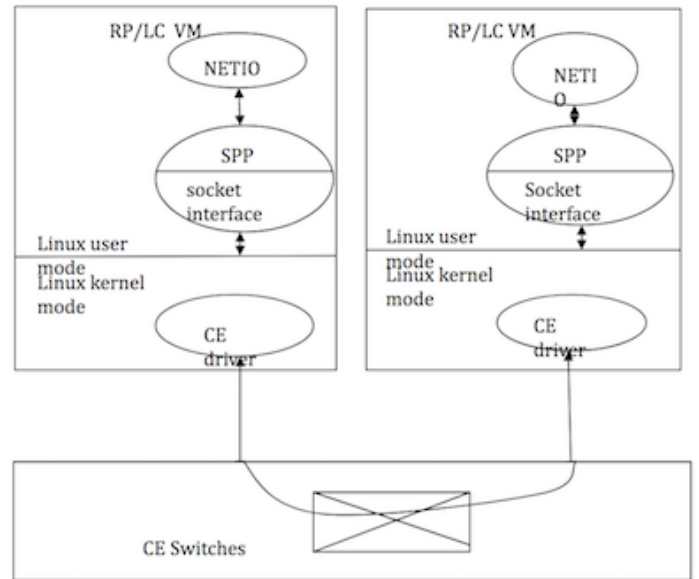
- صقنل ارطن (NPU) تاموسرلا ةجلاعمل ةدحو ىلع LPTS ل TCAM تالاخدا ضعب طقف رفوتت دروم TCAM.
- LC Netio ىلع SW LPTS pre-IFIB يف يسيرلا LPTS شحبا عارج متي.
- PMF يف TCAM نع شحبال لالخ نم ةرشابم RP ىلى NPU نم ةنمضملا LPTS ةمزح: (OSPFv3) الوأ راسم رصقا حتف لوكوتوربو (OSPF) الوأ راسم رصقا حتف لوكوتوربو رشابم لكشب يطايتحال او طشنل rp لوكوتوربو ىلى ISIS مزح هيچوت متي.
- PMF TCAM نع شحبال لالخ نم ةيحمللا ةيزكرملا ةجلاعمل ةدحو ىلى NPU نم LPTS ةمزح: ND و ICMP و UDP و TCP لوكوتوربو مدختسي لوكوتوربو يا.
- ل (CPU) ةيزكرملا ةجلاعمل ةدحو ةمئالم ربع LC يف L2 لوكوتوربو مزح نيمصت متي: BRCM: ARP و RARP و CDP و LACP و LLDP و Ether-link OAM و MACSec.
- ل BRCM ةيزكرملا ةجلاعمل ةدحو ةمئالم لالخ نم LC يف تاءانثتسالال مزح نيمصت متي.

TTL0, TTL1, MTU Override, رايخل مزح

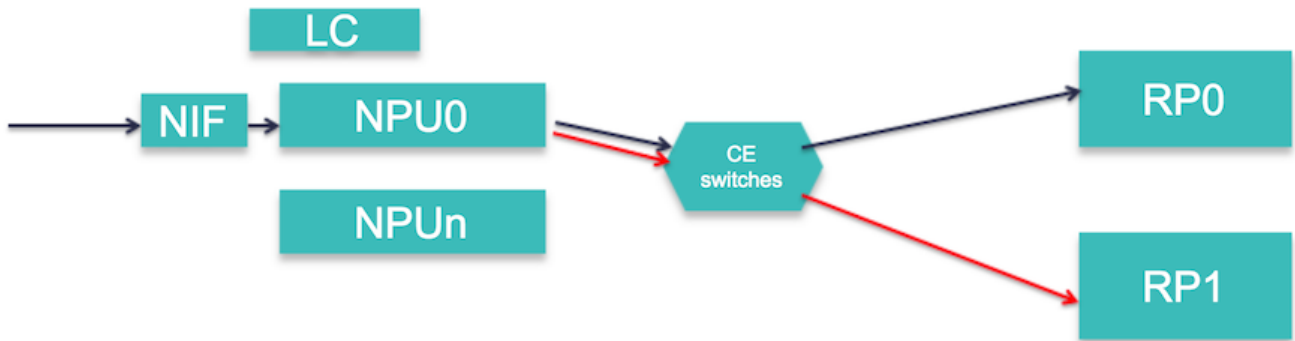
ةي زكرم الة جلال عمل اة دحو ي تدق ع ني ب بق ثم راس م (CPU)

NetIO → SPP → CE switches → SPP → NETIO

CE switches: SC, FC, LC switches

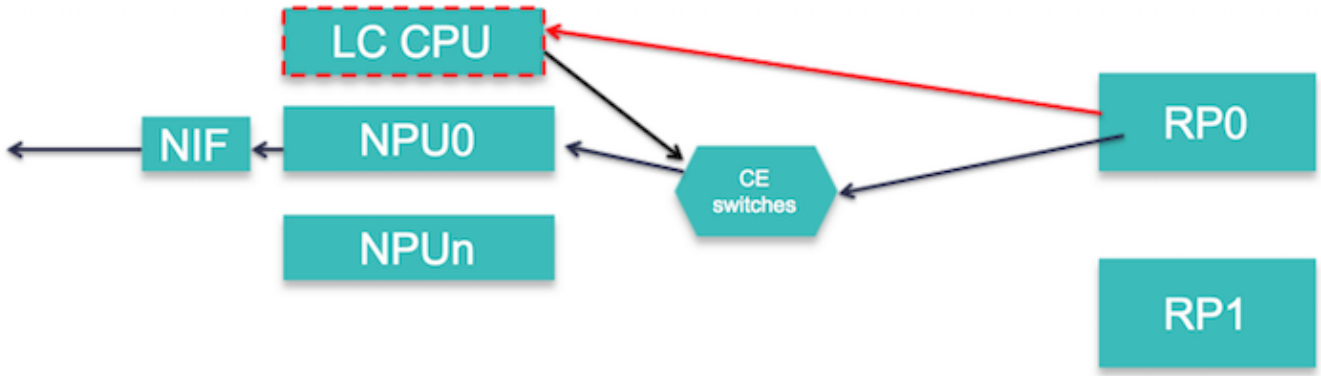


ة دحو ي ل (NPU) ةي زكرم الة جلال عمل اة دحو نم عي مجت ال راس م RP لوكوتورب رب ع (CPU) ةي زكرم الة جلال عمل



STBY RP ي ل رآو طشن ال RP ي ل اة دحو ل اس را م تي. NPU ي ل RX Forus مزح خسن م تي

ة جلال عمل اة دحو ي ل RP ةي زكرم الة جلال عمل اة دحو نم ل ا خ د ل LC و NPU ةي زكرم الة

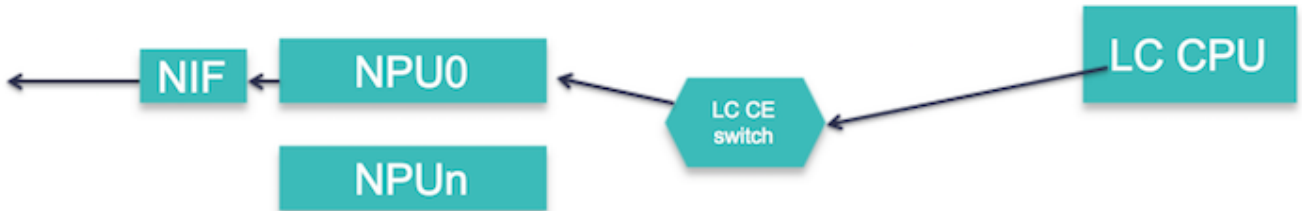


لبق ام ةمزح تناك وأ ةلماك رواجتلا ةئدابلا تناك اذا NPU الى ةرشابم L3 مزح نقح متي راسملا

ةكبشلا يف مكحتلا ةدحوب ةصاخلا (CPU) ةيزكرملا ةجالعمل ةدحوب L3 مزح نقح متي ةلحاح يف (LC) ةيلعمل:

- رواجتلا ةئدابلا نيوكت متي
- MPLS هيجوتلا لبق ام ةمزح
- MTU ةمزحل مجح زواجتي

ةدحوب ةصاخلا (CPU) ةيزكرملا ةجالعمل ةدحو نم راسم لاخذ (NPU) ةيزكرملا ةجالعمل ةدحو الى (LC) ةيزكرملا ةجالعمل



(LC) ةيزكرملا ةجالعمل ةدحوب ةصاخلا (CPU) ةيزكرملا ةجالعمل ةدحو نم مزحل هذه نقح متي (NPU) ةيزكرملا ةجالعمل ةدحو الى:

- ARP، nd، در، ICMP Echo، مزحل
- Ether-Link OAM مزحو LLDP و LACP و CDP

مادختساب ءاطخالا حيحصتل (CLI) رماوالا رطس ةهجاو يوتحمل/مزحل

```
Show SPP node counters location <>
```

```
show netio chain
```

```
show netio drop location <>
```

```
show ipv4/ipv6 traffic location <>
```

```
show fwd statistics location <>
```

```
show lpts pifib entry brief statistics location <>
```

```
show controllers fia diagshell
```

```
show interface <> location <>
```

دع ب ن ع ل اصتال رابتخ

دادترال بلط : ةمزل راسم

```
Local Node[ICMP(RP) -> IP I/O(RP) -> NetIO/Forwarder(RP) -> SPP(RP) -> NPU] -> wire ->  
Remote[NPU -> LPTS(HW) -> SPP(LC) -> NetIO/Forwarder(LC) -> LPTS(SW)(LC) -> IP I/O (LC) -> ICMP  
(LC)]
```

دادترال در : ةمزل راسم

```
Remote Node[IPv4/ICMP (LC) -> FWD/NetIO (LC) -> SPP (LC) -> NPU] -> wire -> Local Node[LPTS(HW)  
-> SPP(LC) -> NetIO/Forwarder(LC) -> NetIO(RP) -> IP I/O (RP) -> ICMP (RP)]
```

ي ل حمل ل اصتال رابتخ

دادترال بلط : ةمزل راسم

```
RP(ICMP/IPv4 IO -> netio -> SPP -> CE) -> LC(SPP -> netio -> ICMP/ipv4 IO)
```

دادترال در : ةمزل راسم

```
LC(IPv4 IO/ICMP -> Netio -> SPP -> CE) -> RP(SPP -> net -> ipv4 io/ICMP)
```

ةدي فم ل ااطخ ال احي حصت

```
debug icmp ipv4 location 0/0/CPU0
```

```
debug ipv4 packet location 0/0/CPU0
```

```
debug ipv4 ping events location 0/0/CPU0
```

اي جولو بوط

Fretta_1(GigabitEthernet0/0/0/16) <---->(GigabitEthernet0/0/0/16) Fretta_2

RP/0/RP0/CPU0:fretta_1# ping 1.1.16.2 count 10000

دع ب نع لاصتال رابتخ نم ققحتل رم اوأ

TX: حمل RP دادترال بلط

Path: ICMP(RP) -> IP I/O(RP) -> NetIO/Forwarder(RP) -> SPP(RP) -> NPU

1. دادترال بلط عاشن مت اذا امم ققحت IP: جارخ/الخد:

show ipv4 traffic brief

ICMP statistics:

Sent: 0 admin unreachable, 0 network unreachable
0 host unreachable, 0 protocol unreachable
0 port unreachable, 0 fragment unreachable
0 time to live exceeded, 0 reassembly ttl exceeded
10000 echo request, 0 echo reply
0 mask request, 0 mask reply
0 parameter error, 0 redirects
10000 total

2. NetIO

RP/0/RP0/CPU0:fretta_1#show netio clients location 0/rp0/cpu0

Counters Errors/Total

Output **0/10019**
Input 0/11804
Puntback 0/0
Jump 0/0
Driver Output 0/10002

Mutex Bypass Counters Total

Egress handled 0
Egress chainwalked 10006
Egress dropped 0
Ingress handled 10000
Ingress chainwalked 0
Ingress dropped 0

ClientID Drop/Total Drop/Total Cur/High/Max Cur/High/Max

ipv6_icmp	0/0	0/0	0/0/1000	0/0/1000
icmp	0/10000	0/0	0/1/1000	0/0/1000

If ping is failing then check if it is getting dropped in Netio:

RP/0/RP0/CPU0:fretta_1#show netio drops location 0/rP0/CPU0
Thu Apr 20 20:28:09.577 UTC

Drops for interfaces on node 0/RP0/CPU0

No drops

3. لوكوتورب SPP

RP/0/RP0/CPU0:fretta_1#show spp node-counters
Thu Apr 20 20:29:05.785 UTC
0/0/CPU0:

```
fretta/classify
  forwarded to spp clients:          10006
  forwarded NPU packet to NetIO:    10006
  dropped in classify node:          24
  Fwded to CoPP sampler:             1
    PUNT ARP:                        1
    PUNT IFIB:                       10006
  IFIB RAWIP4_FM:                   10000
  IFIB RAWIP6_FM:                   6
```

```
-----
client/inject
  pkts injected into spp:            10002
  NetIO->NPU injected into spp:      2
  NetIO->CPU injected into spp:      10000
    NetIO->NPU PROTO ARP:            2
    NetIO->CPU PKT LPTS:             10000
```

```
-----
socket/rx
  ether raw pkts:                   10031
```

```
-----
socket/tx
  ce pkts:                          10002
```

```
-----
client/punt
  punted to client:                 10007
```

0/RP0/CPU0:
socket/rx
 ether raw pkts: 10002
 mgmt interface pkts: 3204

```
-----
socket/tx
  ce pkts:                          10000
  mgmt interface pkts:              5
```

```
-----
fretta/classify
  forwarded to spp clients:          13204
  forwarded CPU packet to NetIO:    10000
  forwarded Mgmt packet to NetIO:   3204
  dropped in classify node:          2
```

```
-----
client/inject
  pkts injected into spp:            10005
  NetIO->NPU injected into spp:      10000
  MGMT_IF injected into spp:         5
  NetIO->NPU PROTO IPV4_PREROUTE:    10000
```

```
-----
client/punt
```


punted to client: 13204

4. كلسلا لىل هلاسرا مت دق ECHO بلط ناك اذ اام ققحت:

```
RP/0/RP0/CPU0:fretta_1#show controllers gigabitEthernet 0/0/0/16 stats | be Egress
Thu Apr 20 21:17:28.176 UTC
```

Egress:

```
Output total bytes          = 1140270
Output good bytes           = 1140270

Output total packets        = 10004
Output 802.1Q frames        = 0
Output pause frames         = 0
Output pkts 64 bytes        = 1
Output pkts 65-127 bytes    = 10003
Output pkts 128-255 bytes   = 0
Output pkts 256-511 bytes   = 0
Output pkts 512-1023 bytes  = 0
Output pkts 1024-1518 bytes = 0
Output pkts 1519-Max bytes  = 0

Output good pkts            = 10004
Output unicast pkts         = 10000
Output multicast pkts       = 3
Output broadcast pkts       = 1

Output drop underrun        = 0
Output drop abort           = 0
Output drop other           = 0

Output error other          = 0
```

دادترالال بلط: Remote LC: RX

```
Path: NPU -> LPTS(HW) -> SPP(LC) -> NetIO/Forwarder(LC) -> LPTS(SW)(LC) -> IP I/O (LC) -> ICMP
(LC)
```

1. كلس نم اهلابقتسا مت دق ةمزحلال تناك اذ اام ققحت:

```
RP/0/RP0/CPU0:fretta_2#show controllers gigabitEthernet 0/0/0/16 stats
Thu Apr 20 20:44:22.115 UTC
Statistics for interface GigabitEthernet0/0/0/16 (cached values):
```

Ingress:

```
Input total bytes          = 1140270
Input good bytes           = 1140270

Input total packets        = 10004
Input 802.1Q frames        = 0
Input pause frames         = 0
Input pkts 64 bytes        = 1
Input pkts 65-127 bytes    = 10003
```

2. دادع نم ققحت LPTS.

```
RP/0/RP0/CPU0:fretta_2#show lpts pifib hardware entry brief location 0/0/CPU0 | i ICMP
Thu Apr 20 20:45:54.687 UTC
```

```

DestIP          SrcIP          vrf  L4  LPort/Type  RPort  npu  Flowtype
DestNode      PuntPrio Accept Drop
0.0.0.0        0.0.0.0          0    1    ECHO        0      0    ICMP-local
Local LC      MEDIUM  10000  0

```

3. لوك وورب SPP

RP/0/RP0/CPU0:fretta_2#show spp node-counters location 0/0/CPU0

```

fretta/classify
  forwarded to spp clients:          10006
  forwarded NPU packet to NetIO:    10006
  dropped in classify node:          22
    Fwded to CoPP sampler:           2
      PUNT ARP:                       2
      PUNT IFIB:                       10006
    IFIB IPv4_STACK:                 10000
    IFIB RAWIP6_FM:                   6
-----
client/inject
  pkts injected into spp:            10002
  NetIO->NPU injected into spp:      10002
    NetIO->NPU PROTO ARP:              2
    NetIO->NPU PROTO IPV4:            10000
-----
socket/rx
      ether raw pkts:                 10030
-----
socket/tx
      ce pkts:                        10002
-----
client/punt
      punted to client:                10008
-----

```

4 - وتين

show netio chains gigabitEthernet 0/0/0/16 location 0/0/cpu0

<12> (ipv4) Stats IN: 10000 pkts, 1140000 bytes; OUT: 10000 pkts, 1140000 bytes

Protocol	SAFI	Pkts In	Bytes In	Pkts Out	Bytes Out
ipv4	Unicast	10000	1140000	10000	1000000
ipv4	Multicast	0	0	0	0
ipv4	Broadcast	0	0	0	0
ipv6	Unicast	0	0	0	0
ipv6	Multicast	0	0	0	0

RP/0/RP0/CPU0:fretta_2#show netio clients location 0/0/CPU0

Thu Apr 20 20:52:26.802 UTC

```

Counters          Errors/Total
-----
Output            0/10002
Input             0/10008
Puntback          0/0
Jump              0/0
Driver Output     0/10002

```

XIPC queues	Dropped/Queued	Cur/High/Max		
OutputL	0/10000	0/1/6000		
OutputH	0/2	0/1/3000		
Puntback	0/0	0/0/6000		

ClientID	Input Drop/Total	Punt Drop/Total	XIPC InputQ Cur/High/Max	XIPC PuntQ Cur/High/Max
ipv6_icmp	0/0	0/0	0/0/1000	0/0/1000
icmp	0/10000	0/0	0/1/1000	0/0/1000
clns	L 0/0 H 0/0	0/0	L 0/0/1000 H 0/0/1000	0/0/0
ipv6_io	0/0	0/0	0/0/1000	0/0/1000
ipv6_nd	0/0	0/0	0/0/1500	0/0/1000
l2snoop	0/0	0/0	0/0/1000	0/0/0
ether_sock	0/0	0/0		
tp_oam	0/0	0/0	0/0/1000	0/0/1000
icmpv6_unreach_jump	0/0	0/0	0/0	0/0
arp	0/2	0/0	0/1/1000	0/0/1000
mpls_io	0/0	0/0	0/0/1000	0/0/1000
ipv4	0/0	0/0	0/0/1000	0/0/1000
ipv6	0/0	0/0	0/0/1000	0/0/1000

Key:

- L = queue for lower priority packets
- H = queue for higher priority packets

5 - ةيمنتلاو ةأرمل ةب عشا ةااصح | 5

```
RP/0/RP0/CPU0:fretta_2#show fwd statistics all location 0/0/cpu0
Thu Apr 20 20:51:50.347 UTC
RECEIVE STATISTICS SUMMARY:
rx_pkts: 10008
punt_pkts: 10008
ingress_total_drops: 0
TRANSMIT STATISTICS SUMMARY:
inject_pkts: 10002
tx_pkts: 10002
egress_total_drops: 0
RP/0/RP0/CPU0:fretta_2#
```

6. IP IOS

```
show ipv4 traffic brief location 0/0/CPU0
```

```
Rcvd: 0 admin unreachable, 0 network unreachable
0 host unreachable, 0 protocol unreachable
0 port unreachable, 0 fragment unreachable
0 time to live exceeded, 0 reassembly ttl exceeded
10000 echo request, 0 echo reply
0 mask request, 0 mask reply
0 redirect, 0 parameter error
0 source quench, 0 timestamp, 0 timestamp reply
0 router advertisement, 0 router solicitation
10000 total, 0 checksum errors, 0 unknown
```

در ةدي عبال ةدق عالا : دادترال در (LC): tx

Path: IPv4/ICMP (LC) -> FWD/NetIO (LC) -> SPP (LC) -> NPU

1. جارخ/الارخ دا IP

RP/0/RP0/CPU0:fretta_2#show ipv4 traffic brief location 0/0/CPU0

ICMP statistics:

Sent: 0 admin unreachable, 0 network unreachable
0 host unreachable, 0 protocol unreachable
0 port unreachable, 0 fragment unreachable
0 time to live exceeded, 0 reassembly ttl exceeded
0 echo request, **10000 echo reply**
0 mask request, 0 mask reply
0 parameter error, 0 redirects
10000 total

2 - ويتن

show netio chains gigabitEthernet 0/0/0/16 location 0/0/cpu0

<12> (ipv4) **Stats IN: 10000 pkts, 1140000 bytes; OUT: 10000 pkts, 1140000 bytes**

Protocol	SAFI	Pkts In	Bytes In	Pkts Out	Bytes Out
ipv4	Unicast	10000	1140000	10000	1000000
ipv4	Multicast	0	0	0	0
ipv4	Broadcast	0	0	0	0
ipv6	Unicast	0	0	0	0
ipv6	Multicast	0	0	0	0

RP/0/RP0/CPU0:fretta_2#show netio clients location 0/0/CPU0

Thu Apr 20 20:52:26.802 UTC

Counters Errors/Total

Output **0/10002**
Input 0/10008
Puntback 0/0
Jump 0/0
Driver Output 0/10002

XIPC queues Dropped/Queued Cur/High/Max

OutputL 0/10000 0/1/6000
OutputH 0/2 0/1/3000
Puntback 0/0 0/0/6000

3 - أارملا ةيمنت ةبعش تاءاصح | 3

RP/0/RP0/CPU0:fretta_2#show fwd statistics all location 0/0/cpu0

Thu Apr 20 20:51:50.347 UTC

RECEIVE STATISTICS SUMMARY:

rx_pkts: 10008
punt_pkts: 10008
ingress_total_drops: 0

TRANSMIT STATISTICS SUMMARY:

inject_pkts: 10002
tx_pkts: 10002
egress_total_drops: 0

4- لوكوت ورب SPP

```
show spp node-counters location 0/0/CPU0
```

```
fretta/classify
  forwarded to spp clients:          10006
  forwarded NPU packet to NetIO:    10006
  dropped in classify node:          22
    Fwded to CoPP sampler:           2
      PUNT ARP:                       2
      PUNT IFIB:                      10006
    IFIB IPv4_STACK:                 10000
    IFIB RAWIP6_FM:                   6
-----
client/inject
  pkts injected into spp:            10002
  NetIO->NPU injected into spp:      10002
    NetIO->NPU PROTO ARP:             2
    NetIO->NPU PROTO IPV4:            10000
-----
socket/rx
  ether raw pkts:                    10030
-----
socket/tx
  ce pkts: 10002
-----
client/punt
  punted to client:                  10008
-----
```

5. كلسل الة مزحلا لاسرا مت دق ناك اذا ام ققحت.

```
RP/0/RP0/CPU0:fretta_2#show controllers gigabitEthernet 0/0/0/16 stats
```

```
Thu Apr 20 21:20:22.593 UTC
```

```
Statistics for interface GigabitEthernet0/0/0/16 (cached values):
```

```
Egress:
```

```
  Output total bytes          = 1140270
  Output good bytes           = 1140270

  Output total packets        = 10004
  Output 802.1Q frames        = 0
  Output pause frames         = 0
  Output pkts 64 bytes        = 1
  Output pkts 65-127 bytes    = 10003
  Output pkts 128-255 bytes    = 0
  Output pkts 256-511 bytes    = 0
  Output pkts 512-1023 bytes   = 0
  Output pkts 1024-1518 bytes  = 0
  Output pkts 1519-Max bytes   = 0

  Output good pkts            = 10004
  Output unicast pkts         = 10000
  Output multicast pkts       = 3
  Output broadcast pkts       = 1

  Output drop underrun        = 0
  Output drop abort           = 0
  Output drop other           = 0

  Output error other          = 0
```

6. هجاولا تالاج

```
RP/0/RP0/CPU0:fretta_2#show int gigabitEthernet 0/0/0/16
Thu Apr 20 21:21:37.942 UTC
GigabitEthernet0/0/0/16 is up, line protocol is up
Interface state transitions: 1
Hardware is GigabitEthernet, address is 008a.964a.7040 (bia 008a.964a.7040)
Internet address is 1.1.16.2/24
MTU 1514 bytes, BW 1000000 Kbit (Max: 1000000 Kbit)
  reliability 255/255, txload 0/255, rxload 0/255
Encapsulation ARPA,
Full-duplex, 1000Mb/s, link type is force-up
output flow control is off, input flow control is off
Carrier delay (up) is 10 msec
loopback not set,
Last link flapped 01:00:13
ARP type ARPA, ARP timeout 04:00:00
Last input 00:56:58, output 00:56:58
Last clearing of "show interface" counters never
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  10004 packets input, 1140270 bytes, 0 total input drops
    3 drops for unrecognized upper-level protocol
  Received 1 broadcast packets, 3 multicast packets
    0 runts, 0 giants, 0 throttles, 0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    10004 packets output, 1140270 bytes, 0 total output drops
  Output 1 broadcast packets, 3 multicast packets
  0 output errors, 0 underruns, 0 applique, 0 resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions
```

در ةي لحم ل ةدق ع ل : داد تر ال در (LC): Rx

```
LPTS(HW) -> SPP(LC) -> NetIO/Forwarder(LC) -> LPTS PreIFIB Lookup -> SPP(LC) -> CE(LC) ->
SPP(RP) -> NetIO(RP) -> IP I/O (RP) -> ICMP (RP)
```

1. ك ل س ل ن م ة درا و م ز ح ل ت ن ا ك ا ذ ا م ق ق ح ت .

```
RP/0/RP0/CPU0:fretta_1#show controllers gigabitEthernet 0/0/0/16 stats
Thu Apr 20 21:17:28.176 UTC
Statistics for interface GigabitEthernet0/0/0/16 (cached values):
```

Ingress:

```
Input total bytes          = 1140270
Input good bytes           = 1140270

Input total packets        = 10004
Input 802.1Q frames        = 0
Input pause frames         = 0
Input pkts 64 bytes        = 1
Input pkts 65-127 bytes    = 10003
Input pkts 128-255 bytes   = 0
Input pkts 256-511 bytes   = 0
Input pkts 512-1023 bytes  = 0
Input pkts 1024-1518 bytes = 0
Input pkts 1519-Max bytes  = 0

Input good pkts           = 10004
```

```

Input unicast pkts      = 10000
Input multicast pkts   = 3
Input broadcast pkts   = 1

Input drop overrun     = 0
Input drop abort       = 0
Input drop invalid VLAN = 0
Input drop invalid DMAC = 0
Input drop invalid encap = 0
Input drop other       = 0

Input error giant      = 0
Input error runt       = 0
Input error jabbers    = 0
Input error fragments  = 0
Input error CRC        = 0
Input error collisions = 0
Input error symbol     = 0
Input error other      = 0

Input MIB giant        = 0
Input MIB jabber       = 0
Input MIB CRC          = 0

```

2 - LPTS إعدادات

```
RP/0/RP0/CPU0:fretta_1#show lpts pifib hardware entry brief locatio 0/0/CPU0
```

```

0.0.0.0          0.0.0.0          0    1    ECHOREPLY    0    0    ICMP-app-default
Local LC        LOW          10000 0

```

3. LC إعدادات SPP

```
RP/0/RP0/CPU0:fretta_1#show spp node-counters location 0/0/CPU0
```

```
Thu Apr 20 21:01:31.974 UTC
```

```
fretta/classify
```

```

forwarded to spp clients:          10006
forwarded NPU packet to NetIO:    10006
dropped in classify node:          24
  Fwded to CoPP sampler:           1
    PUNT ARP:                       1
    PUNT IFIB:                       10006
  IFIB RAWIP4_FM:                  10000
  IFIB RAWIP6_FM:                   6

```

```
-----
client/inject
```

```

pkts injected into spp:            10002
NetIO->NPU injected into spp:      2
NetIO->CPU injected into spp:      10000
  NetIO->NPU PROTO ARP:             2
  NetIO->CPU PKT LPTS:              10000

```

```
-----
socket/rx
```

```

ether raw pkts: 10031

```

```
-----
socket/tx
```

```

ce pkts: 10002

```

```
-----
client/punt
```

```

punted to client: 10007

```

4. Netio لى LC

```
RP/0/RP0/CPU0:fretta_1# show netio chains gigabitEthernet 0/0/0/16 location 0/0/cpu0
```

```
<12> (ipv4)  Stats IN: 10000 pkts, 1140000 bytes; OUT: 0 pkts, 0 bytes
```

```
Protocol SAFI counts:
```

Protocol	SAFI	Pkts In	Bytes In	Pkts Out	Bytes Out
ipv4	Unicast	10000	1140000	0	0
ipv4	Multicast	0	0	0	0
ipv4	Broadcast	0	0	0	0
ipv6	Unicast	0	0	0	0
ipv6	Multicast	0	0	0	0

5. لى LC FWD تايئاصح.

```
RP/0/RP0/CPU0:fretta_1#show fwd statistics all location 0/0/CPU0
```

```
Thu Apr 20 21:04:27.767 UTC
```

```
RECEIVE STATISTICS SUMMARY:
```

```
rx_pkts: 10007
```

```
punt_pkts: 10007
```

```
ingress_total_drops: 0
```

```
TRANSMIT STATISTICS SUMMARY:
```

```
inject_pkts: 10002
```

```
tx_pkts: 10002
```

```
egress_total_drops: 0
```

```
RP/0/RP0/CPU0:fretta_1#
```

5. RP لى SPP لى هل اس رال لى LC لى SPP.

```
RP/0/RP0/CPU0:fretta_1#show spp node-counters location 0/0/CPU0
```

```
Thu Apr 20 21:01:31.974 UTC
```

```
fretta/classify
```

```
forwarded to spp clients: 10006
```

```
forwarded NPU packet to NetIO: 10006
```

```
dropped in classify node: 24
```

```
Fwded to CoPP sampler: 1
```

```
PUNT ARP: 1
```

```
PUNT IFIB: 10006
```

```
IFIB RAWIP4_FM: 10000
```

```
IFIB RAWIP6_FM: 6
```

```
client/inject
```

```
pkts injected into spp: 10002
```

```
NetIO->NPU injected into spp: 2
```

```
NetIO->CPU injected into spp: 10000
```

```
NetIO->NPU PROTO ARP: 2
```

```
NetIO->CPU PKT LPTS: 10000
```

```
socket/rx
```

```
ether raw pkts: 10031
```

```
socket/tx
```

```
ce pkts: 10002
```



```

-----
client/punt
      punted to client:          10007
-----

```

6. SPP علس RP

```

RP/0/RP0/CPU0:fretta_1#show spp node-counters location 0/rP0/CPU0
Thu Apr 20 21:06:33.045 UTC

```

```

socket/rx
      ether raw pkts:          10002
      mgmt interface pkts:    16651
-----

```

```

socket/tx
      ce pkts:                10000
      mgmt interface pkts:    14
-----

```

```

fretta/classify
      forwarded to spp clients: 26651
      forwarded CPU packet to NetIO: 10000
      forwarded Mgmt packet to NetIO: 16651
      dropped in classify node: 2
-----

```

```

client/inject
      pkts injected into spp: 10014
      NetIO->NPU injected into spp: 10000
      MGMT_IF injected into spp: 14
      NetIO->NPU PROTO IPV4_PREROUTE: 10000
-----

```

```

client/punt
      punted to client:          26651
-----

```

7. Netio علس RP.

```

RP/0/RP0/CPU0:fretta_1#show netio clients location 0/RP0/CPU0
Thu Apr 20 21:05:05.977 UTC

```

Counters	Errors/Total
Output	0/10031
Input	0/25872
Puntback	0/0
Jump	0/0
Driver Output	0/10014

Mutex Bypass Counters	Total
Egress handled	0
Egress chainwalked	10018
Egress dropped	0
Ingress handled	10000
Ingress chainwalked	0
Ingress dropped	0

XIPC queues	Dropped/Queued	Cur/High/Max
OutputL	0/10004	0/1/6000
OutputH	0/14	0/1/3000
Puntback	0/0	0/0/6000
PMutex_egressL	0/10004	0/1/6000

Mutex Bypass Counters	Total
Egress handled	0
Egress chainwalked	10018
Egress dropped	0
Ingress handled	10000
Ingress chainwalked	0
Ingress dropped	0

XIPC queues	Dropped/Queued	Cur/High/Max
OutputL	0/10004	0/1/6000
OutputH	0/14	0/1/3000
Puntback	0/0	0/0/6000
PMutex_egressL	0/10004	0/1/6000

```

PMutex_egressH          0/14          0/1/1500
PMutex_ingressL        0/0          0/0/6000
PMutex_ingressH        0/0          0/0/1500

```

ClientID	Input Drop/Total	Punt Drop/Total	XIPC InputQ Cur/High/Max	XIPC PuntQ Cur/High/Max
ip6_icmp	0/0	0/0	0/0/1000	0/0/1000
icmp	0/10000	0/0	0/1/1000	0/0/1000
clns	L 0/0	0/0	L 0/0/1000	0/0/0
	H 0/0		H 0/0/1000	
eth_mgmt	0/0	0/0		
ip6_io	0/0	0/4	0/0/1000	0/1/1000
ip6_nd	0/4	0/0	0/1/1500	0/0/1000
l2snoop	0/0	0/0	0/0/1000	0/0/0
ether_sock	0/0	0/0		
icmpv6_unreach_jump	0/0	0/0		
raw	L 0/0	0/0	L 0/0/1600	0/0/0
	H 0/0		H 0/0/1600	
tcp	L 0/0	0/0	L 0/0/1600	0/0/0
	H 0/0		H 0/0/1600	
udp	L 0/307	0/0	L 0/1/1600	0/0/0
	H 0/0		H 0/0/1600	
arp	0/15565	0/0	0/4/1000	0/0/1000
mpls_io	0/0	0/0	0/0/1000	0/0/1000
lspv_server	0/0	0/0		
ip4	0/0	0/0	0/0/1000	0/0/1000
ip6	0/0	0/0	0/0/1000	0/0/1000

Key:

L = queue for lower priority packets
H = queue for higher priority packets

8. جارخ/الارخ دا

```
RP/0/RP0/CPU0:fretta_1#
```

```
RP/0/RP0/CPU0:fretta_1#show ipv4 traffic brief
```

```

Rcvd: 0 admin unreachable, 0 network unreachable
      0 host unreachable, 0 protocol unreachable
      0 port unreachable, 0 fragment unreachable
      0 time to live exceeded, 0 reassembly ttl exceeded
      0 echo request, 10000 echo reply
      0 mask request, 0 mask reply
      0 redirect, 0 parameter error
      0 source quench, 0 timestamp, 0 timestamp reply
      0 router advertisement, 0 router solicitation
      10000 total, 0 checksum errors, 0 unknown

```

9. ةءءاولا ءالارء:

```

RP/0/RP0/CPU0:fretta_1# show int gigabitEthernet 0/0/0/16
Thu Apr 20 21:22:12.822 UTC
GigabitEthernet0/0/0/16 is up, line protocol is up
Interface state transitions: 1
Hardware is GigabitEthernet, address is 008a.964b.7040 (bia 008a.964b.7040)
Internet address is 1.1.16.1/24
MTU 1514 bytes, BW 1000000 Kbit (Max: 1000000 Kbit)
  reliability 255/255, txload 0/255, rxload 0/255
Encapsulation ARPA,
Full-duplex, 1000Mb/s, link type is force-up

```

```
output flow control is off, input flow control is off
Carrier delay (up) is 10 msec
loopback not set,
Last link flapped 01:01:11
ARP type ARPA, ARP timeout 04:00:00
Last input 00:58:03, output 00:58:03
Last clearing of "show interface" counters never
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
  10004 packets input, 1140270 bytes, 0 total input drops
  3 drops for unrecognized upper-level protocol
  Received 1 broadcast packets, 3 multicast packets
    0 runts, 0 giants, 0 throttles, 0 parity
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  10004 packets output, 1140270 bytes, 0 total output drops
  Output 1 broadcast packets, 3 multicast packets
  0 output errors, 0 underruns, 0 applique, 0 resets
  0 output buffer failures, 0 output buffers swapped out
  0 carrier transitions
```

RP/0/RP0/CPU0:fretta_1#

ي لحمل ل لاصت ال رابت خ

<tbd>

ةمچرتل هذه لوح

ةللأل تاينقتل نم ةومچم مادختساب دنن سمل اذہ Cisco تچرت
ملاعلاء انءمچي فني مدخت سمل معدى وتحم مي دقتل ةيرشبل او
امك ةقيد نوك تنل ةللأل ةمچرت لصف أن ةظحال مچري. ةصاخل مه تلبل
Cisco يلخت. فرتحم مچرت مامدقي يتل ةيفارتحال ةمچرتل عم لالحل وه
ىل إامءاد ةوچرلاب ي صؤت وتامچرتل هذه ةقد نع اهتيل وئسم Cisco
Systems (رفوتم طبارل) يلصلأل يزي لچنل دنن سمل