

NCS 5500: Leven van een pakket (douanevervoer, punt/inspuiting, Ping Path)

Inhoud

[Inleiding](#)

[Leven van een pakket in doorsturen van ASIC](#)

[ASIC voor doorsturen van leidingen](#)

[IRPP \(Poortbepaling, parser\)](#)

[Punt](#)

[Pad tussen twee CPU-knooppunten](#)

[Pad van NPU naar RP](#)

[Injecteren van RP naar NPU of LC CPU](#)

[Pad van LC CPU naar NPU injecteren](#)

[CLI voor Punt/Injecteer Debugging](#)

[Afstandsbediening](#)

[Pad: Echo-aanvraag](#)

[Pad: Echo-antwoord](#)

[Lokale ping](#)

[Pad: Echo-aanvraag](#)

[Pad: Echo-antwoord](#)

[Handige debugs:](#)

[Topologie](#)

[Opdrachten om afstandsbediening te controleren](#)

[Echo-aanvraag: Lokale RP: TX](#)

[Echo-aanvraag: Remote LC: RX](#)

[Echo-antwoord: Remote-knooppunt \(LC\): TX](#)

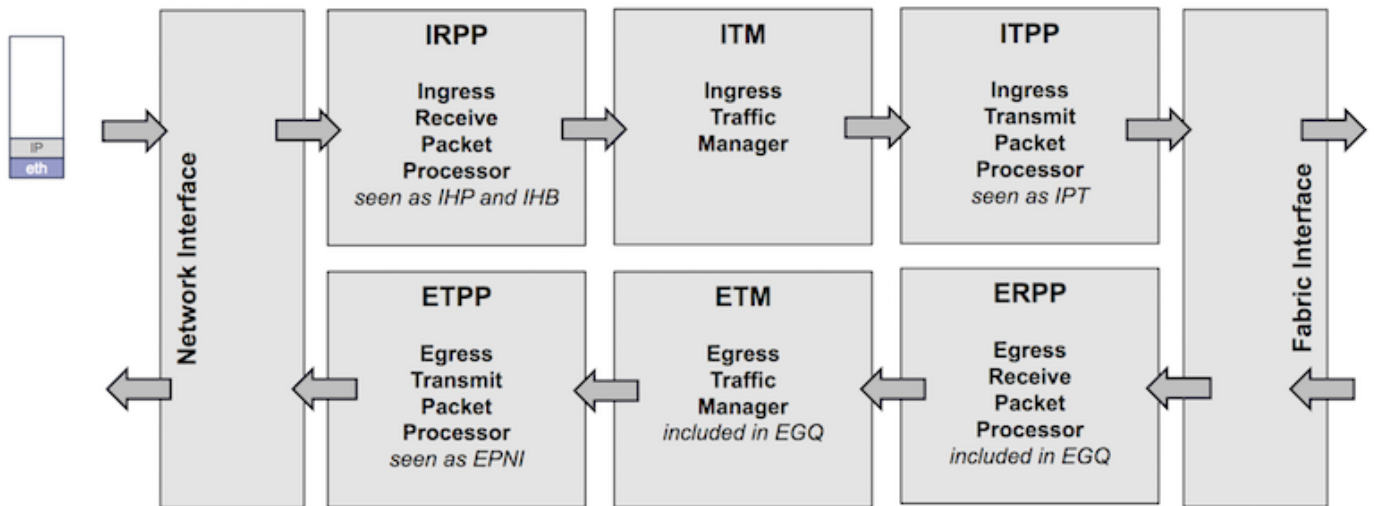
[Echo-antwoord: Lokaal knooppunt \(LC\): RX](#)

[Lokale ping](#)

Inleiding

Dit document beschrijft het pad dat is genomen door de pakketten van de echo van het ICMP/Echo Reactie in NCS 55xx (Fretta) vakje.

Leven van een pakket in doorsturen van ASIC



IRPP

Een pakket wordt ontvangen op een interface en doorgegeven naar IRPP, waar de eerste 128 bytes worden verwijderd en verwerkt. Hierdoor wordt de kop van het interne systeem toegevoegd.

ITM

Het pakket wordt opgeslagen in DRAM/OCB

ITPP

Indien nodig herschrijven van de systeemheader (multicast replicatie, poortbewaking, enz.)

Packets worden gesplitst in cellen en geladen om te maken

ERPP

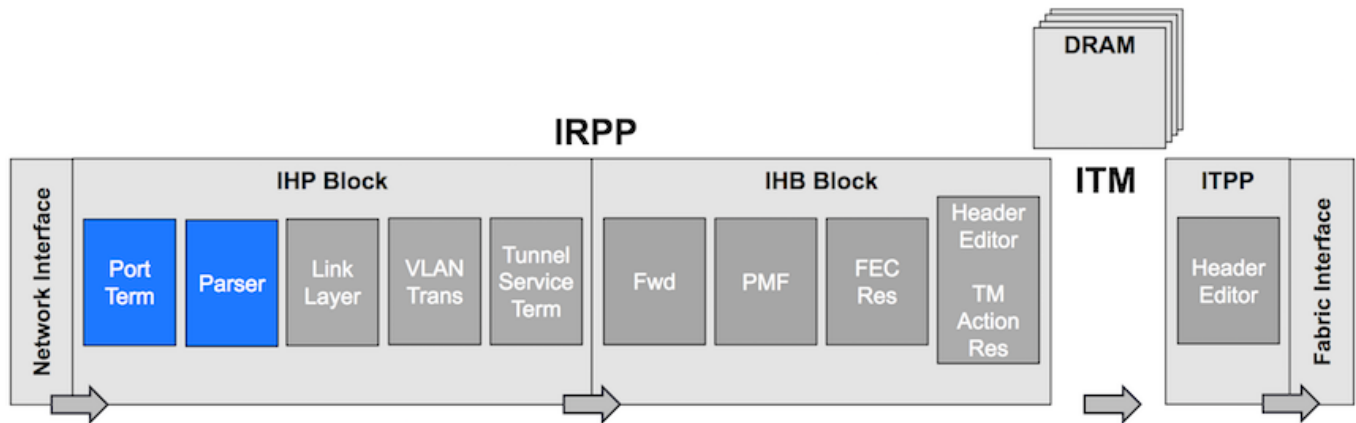
De cellen worden ontvangen en opnieuw gemonteerd. De eerste 128 bytes worden geëxtraheerd en passen alle link-laagfilters, uitgaande ACL's, uitgaande replicatie (multicast) toe

ETPP/ETM

Het gehele pakket wordt in een buffer opgeslagen totdat het pakket is uitgezet. Systeemkopregels worden verwijderd.

ASIC voor doorsturen van leidingen

IRPP (Poortbepaling, parser)

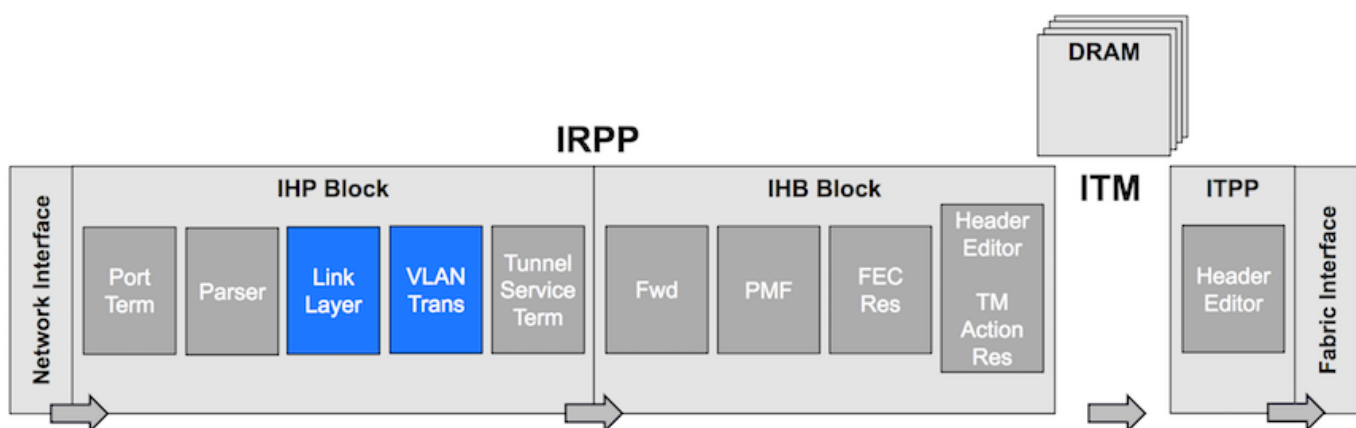


Poortbeëindiging: Packet dat wordt ontvangen vanaf netwerkinterface/CPU/recirculatie

- Bepaal de bronpoort en merk het pakket mee.
- Beslissen van het oorspronkelijke programma voor gebruik in Parser.
- Identificeer waar de netwerkheader begint.

Parser: Extract EtherSwitch, MAC-adressen, bepalen offset voor de volgende fasen in de pijpleiding.

IRP (Line Layer, VLAN Trans)



Link Layer: Filtering op L2 en bronadresverificatie.

VLAN-omzetting: We stellen de logische interface van het pakje in kaart.

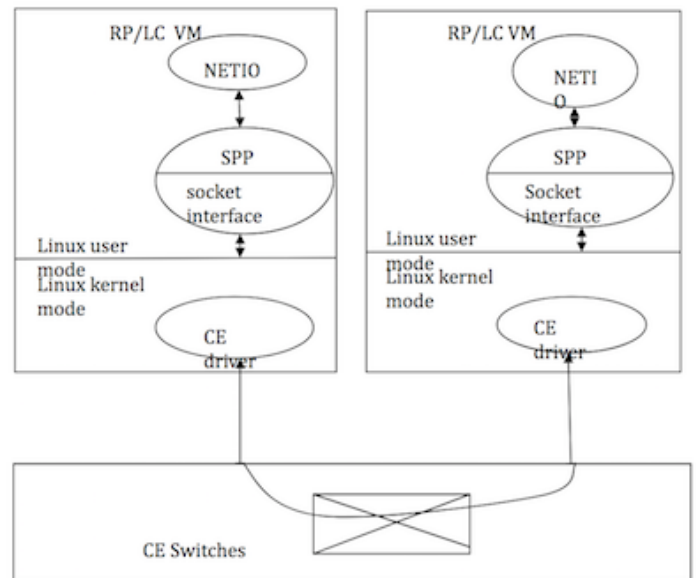
Punt

- Door een gebrek aan TCAM-middelen zijn er slechts een paar lpg-items beschikbaar op de NPU.
- Belangrijke LPTS-raadpleging wordt uitgevoerd bij SW LPTS Pre-IFIB op LC Netio
- LPTS-puntpakket van NPU naar RP rechtstreeks via PMF TCAM raadpleging: OSPF, OSPFv3 mcast, ISIS-pakketten worden rechtstreeks naar actieve en standby RP gestraft
- LPTS puntpakket van NPU naar lokale CPU via raadpleging van PMF TCAM: Elk protocol dat TCP, UDP gebruikt; ICMP, ND
- L2-protocolpakketten worden via de BRCM CPU-val naar LC gestraft: ARP, RARP, CDP, LACP, LDP, Ether-link OAM, MACSec
- Uitzonderingspakketten worden via de BRCM CPU-val naar LC gestraft. TTL0, TTL1, MTU

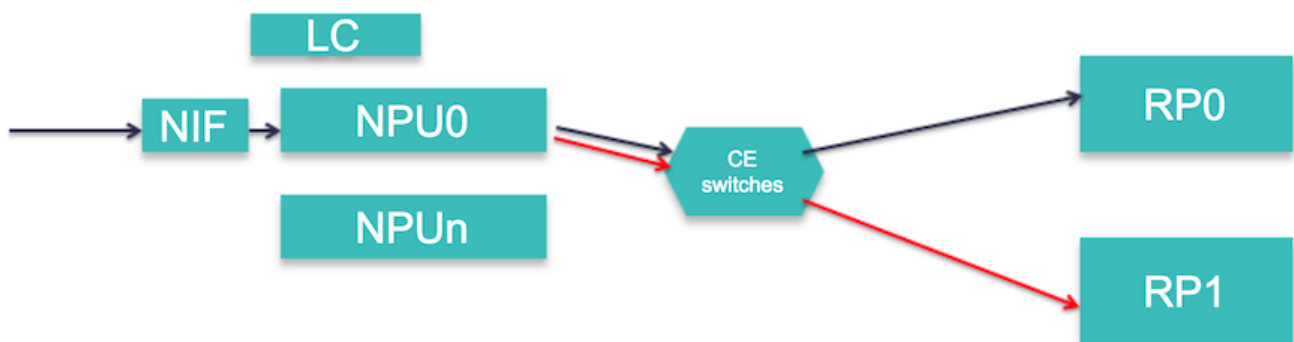
Pad tussen twee CPU-knooppunten

NetIO → SPP → CE switches → SPP → NETIO

CE switches: SC, FC, LC switches

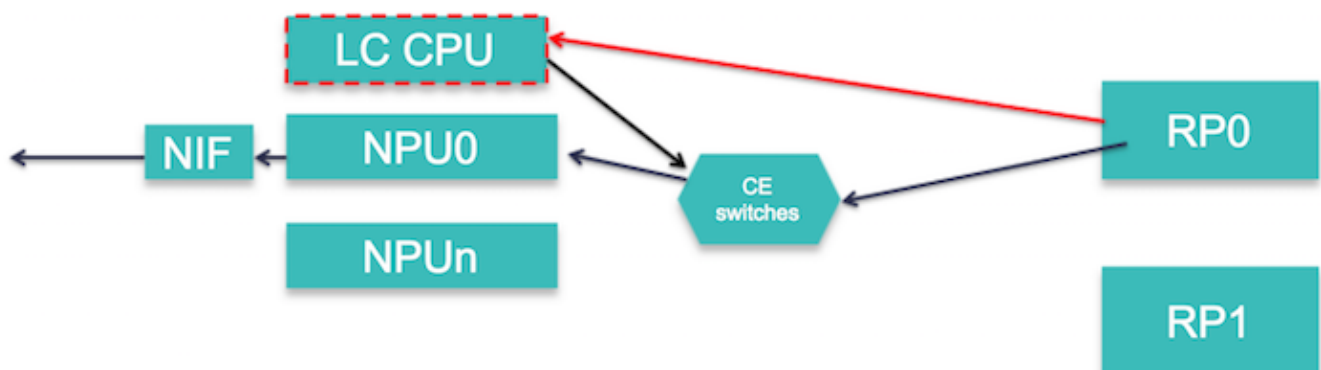


Pad van NPU naar RP



RX Forus-pakketten worden op NPU herhaald. De ene wordt naar de actieve RP gestuurd en de andere naar de Stby RP

Injecteren van RP naar NPU of LC CPU

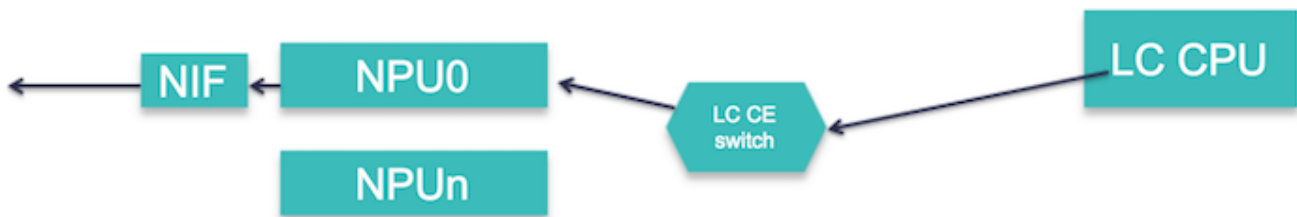


L3-pakketten worden direct aan NPU geïnjecteerd indien de nabijheid van de voorvoegsel is voltooid of als het een pakketje van vóór de route is

L3-pakketten worden ingespoten op LC CPU's voor het geval:

- De prefixnabijheid is GLEAN.
- MPLS-voorroute pakket
- Packet size is groter dan MTU.

Pad van LC CPU naar NPU injecteren



Deze pakketten worden van LC CPU aan NPU toegediend:

- ARP-, ND-, ICMP-Echo-respons, gefragmenteerde pakketten
- CDP, LACP, LLDP, Ether-link OAM-pakketten

CLI voor Punt/Injecteer Debugging

```
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 <>
```

Afstandsbediening

Pad: Echo-aanvraag

```
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)]
```

Pad: Echo-antwoord

```
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)]
```

Lokale ping

Pad: Echo-aanvraag

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

Pad: Echo-antwoord

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

Handige debugs:

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

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

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

Topologie

```
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
```

Opdrachten om afstandsbediening te controleren

Echo-aanvraag: Lokale RP: TX

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

1. I/O via IP: Controleer of Echo-aanvraag is gegenereerd:

```
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. 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. Controleer of Echo-aanvraag via e-mail is verstuurd:

```

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

```

Echo-aanvraag: Remote LC: RX

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

1. Controleer of de verpakking via de draad is ontvangen:

```

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. Controleer de lpg-teller.

```

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. 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. Opmerking

```
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	0/0	L 0/0/1000	0/0/0
	H 0/0		H 0/0/1000	
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. FW-status

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-software

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

Echo-antwoord: Remote-knooppunt (LC): TX

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

1. IP IO

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. Opmerking

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. STATEN VAN DE FWD

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. 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. Controleer of het pakje naar buiten is gestuurd.

```

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. Interfacestatistieken

```

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
```

Echo-antwoord: Lokaal knooppunt (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. Controleer of pakketten via draad worden ingevoerd.

```
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-tellers

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. SPP op LC

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. Netisering op 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. De FWD staat op LC.

```
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. SPP op LC om naar SPP te sturen op RP.

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

```
ClientID                Input              Punt              XIPC InputQ      XIPC PuntQ
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
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
ipv6_io                   0/0                0/4                0/0/1000         0/1/1000
ipv6_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                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		
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

8. IP-O

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. Interfacestatistieken:

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#

Lokale ping

<TBD>