

# Layer 2-hardware valideren op Catalyst 9000 Series Switches

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## Inleiding

Dit document beschrijft hoe u Layer 2-hardwareprogrammering en -doorsturen op Catalyst 9400 Series switches moet valideren.

# Voorwaarden


## Vereisten

Er zijn geen specifieke vereisten van toepassing op dit document.


## Gebruikte componenten

De informatie in dit document is gebaseerd op de switch van de Catalyst 9400 (UADP 2.0) reeks.

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 Opmerking: de softwareversie die in dit document wordt gebruikt, is 16.6.1, maar dit blijft van toepassing voor latere versies van Cisco IOS®.

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 Opmerking: u kunt dit document gebruiken voor andere typen Catalyst 9000 switches, maar u kunt elke opdracht negeren die verwijst naar een lijnkaart.

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De informatie in dit document is gebaseerd op de apparaten in een specifieke laboratoriumomgeving. Alle apparaten die in dit document worden beschreven, hadden een opgeschoonde (standaard)configuratie. Als uw netwerk live is, moet u zorgen dat u de potentiële impact van elke opdracht begrijpt.

## Achtergrondinformatie

Catalyst 9400 Supervisor1 (C9400-SUP-1) heeft 3 UADP 2.0 doorsturen-ASIC's (0, 1, 2).

Elke UADP 2.0 Forwarding ASIC heeft:

- Een duale Core (0, 1) - dit bestond niet in eerdere generaties van UADP 2.0 ASICs.
- SIF's (Stack Interfaces) - gebruikt voor aansluiting op de andere 2 UADP 2.0 ASIC's via een interne stacking.
- NIF's (Network Interfaces) - gebruikt om verbinding te maken met 1 of meer lijnkaarten via de backplane.
- Alle pakketdoorsturen beslissingen voor de lijnkaarten en de Supervisor uplink-interfaces worden genomen door de 3 UADP 2.0 doorsturen ASIC's op de actieve Supervisor.
- De lijnkaarten die in dit voorbeeld worden gebruikt hebben 1 lijnkaart single core stub ASIC die niet betrokken is bij pakketdoorsturen beslissingen.
- De lijnkaartstub ASIC op de lijnkaart verbindt met 1 of meer van de 3 UADP 2.0 doorsturen ASIC's op de Supervisor via de backplane.
- 3 UADP 2.0 die ASICs op de Supervisor door:sturen maakt al pakket het door:sturen besluiten.

## Terminologie

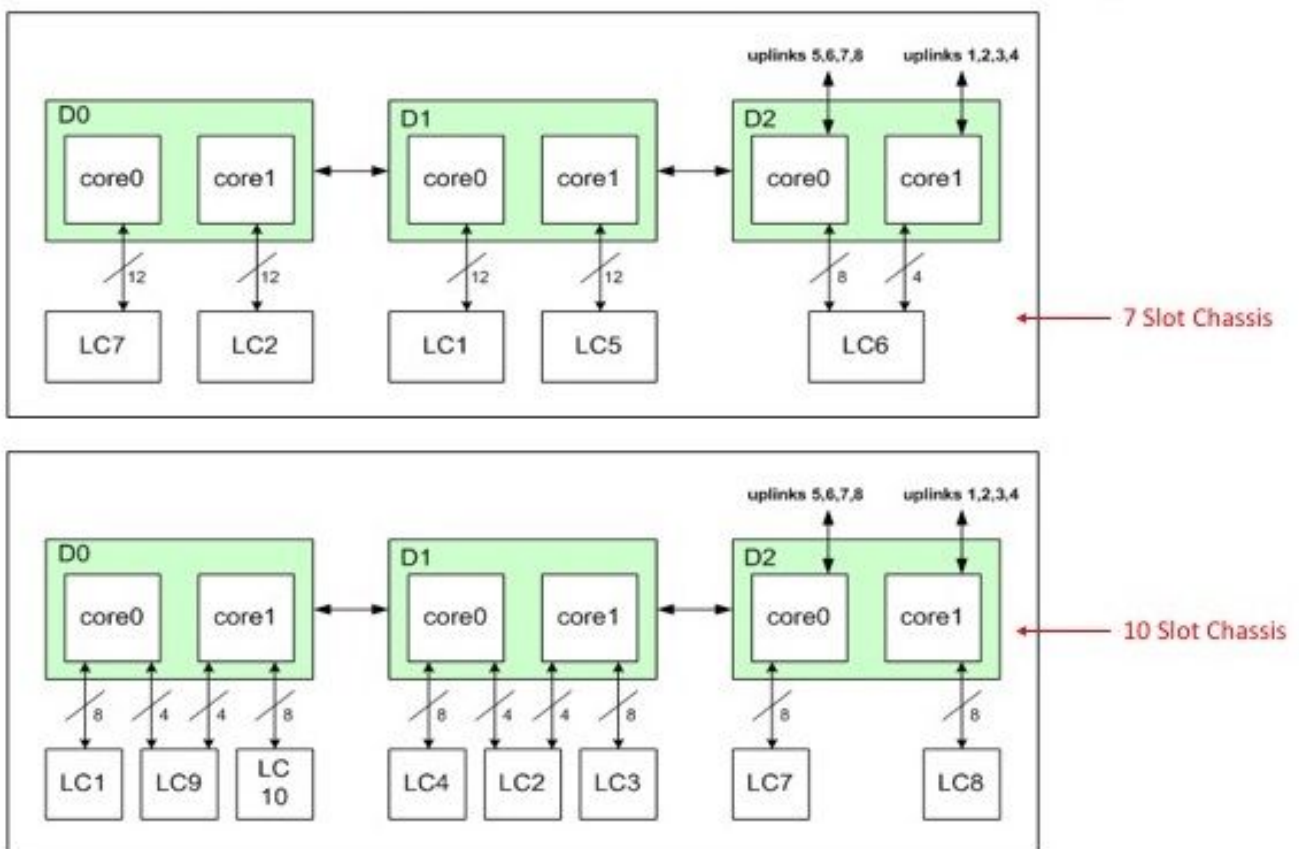
acroniem	Definitie
RP	Routeprocessor
FP	Doorsturen processor
FED	Forwarding Engine Driver. Het softwareproces dat de Supervisor Forwarding ASIC programmeert.
Objectbeheerder	FP software MAC-vermeldingen die als asynchrone objecten in de objectdatabase worden opgeslagen.
LSMPI	Linux gedeelde geheugen punt interface. Het transport tussen het gegevensvlak (hardware-UADP 2.0) en het regelvlak (software-CPU).
IFM	Softwareproces voor Interface Manager.
IF_ID	Interface IDentifier is een unieke waarde die een specifieke interface vertegenwoordigt. Het wordt gebruikt tijdens de interne programmering in de switch.
Inst	Bijvoorbeeld. Geeft aan dat de UADP 2.0 Asic/Core een interface is verbonden met: 0=Asic0/Core0, 1=Asic0/Core1, 2=Asic1/Core0, 3=Asic1/Core1, 4=Asic2/Core0, 5=Asic2/Core1.
Aziatisch	Specificeert welke UADP 2.0 interface is gekoppeld aan: 0=UADP 2.0 #0, 1=UADP 2.0 #1, 2= UADP 2.0 #2.
Kern	Specificeert welke kern op de UADP 2.0 interface is geassocieerd met: 0=core0, 1=core1.
Port	Gewoon instantienummer van een poort in een sleuf. Binnen dezelfde sleuf zijn alle poortnummers uniek.
Subpoort	Identificeert een poort binnen een poortgroep (Cntx) voor voorpaneelpoorten die gesubporteerd zijn (Cntx & SubPort identificeren samen een unieke poort die gesubporteerd is).

Mac	Interface-identificer die wordt gebruikt als een interface wordt uitgevoerd met MACsec (security authenticatie en encryptie).
Context	Context. Een groepsnummer van een poort behoort tot wanneer een voorpaneelinterface subport is (Cntx & SubPort identificeren samen een unieke poort die Sub-Port is).
LPN	Logisch poortnummer gekoppeld aan een interface.
GPN	Wereldwijde poortnummers die aan een interface zijn gekoppeld.
Type NIF	Netwerkinterface; NRU = Redundante uplink voor netwerk
IF_IS	Interface-IDentificer. Dit is een unieke waarde die een specifieke interface vertegenwoordigt. Het wordt gebruikt tijdens verschillende programma's intern in de switch.
Port_LE	Logische poortentiteit. Dit is de interfaceconfiguratie.
AOM	Asynchrone objectbeheerder. De FP programmeert informatie in de objectdatabase als een object.
VP	Virtuele poort
MATM	MAC-adrestabelbeheer
RP	Routeprocessor
OM_PTR	Aanwijzer voor Objectbeheer
Tbl_ID	Tabelidentificatiecode = VLAN
CMAN	Chassis Manager
FP	Doorsturen processor

Fp_poort	De poorten op het voorpaneel.
Sif	Stapelinterface (naar de andere 2 UADP 2.0-doorsturen-ASIC's op de Supervisor).
Nif	Netwerkinterface (naar de voorpaneelinterface)
IGR/EGR	Ingang / Uitgang
IQS	Ingress Queue Scheduler
SQS	Stapelwachtrij
PBC	Packet buffer complex
AQM	Active Queue Management. Dit voert controles uit op congestiebeheer.
AQMR	Active Queue Management - willekeurige vroege detectie.
EQC	Uitgangs-wachtrijcontroller
ESM	Uitgaande plannerbeheer
RWE	Herschrijf de engine. Hiermee wordt headerinformatie toegevoegd of verwijderd uit het pakket.
IOMD	Stuurprogramma voor invoermodule
Fp_poort	De poort op het voorpaneel.
Nif	Netwerkinterface (naar de voorpaneelinterface)
SLI	System Link Interface (naar de supervisor)
IGR / EGR =	Ingang / Uitgang

AQMR	Active Queue Management - willekeurige vroege detectie.
OCI	Out-of-band Control Interface = intern communicatiekanaal tussen de lijnkaart en actieve supervisor
MATM	MAC-adrestabelbeheer
Aantal MAC-verplaatsen	Dit is de telling voor wanneer een adres van MAC beweegt (geleerd) op een nieuwe interface. Het aantal verplaatsingen kan optreden wanneer een eindhost fysiek van de ene interface naar de andere wordt verplaatst, een draadloze host van het ene access point (AP) naar een andere AP die op een andere interface is aangesloten, of de wijzigingen of lijnen van het omspanningsboompad.

## Line Card (LC) to UADP 2.0 Mapping



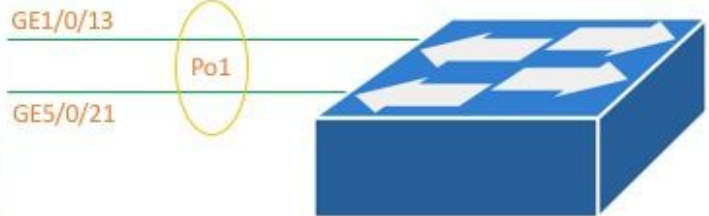
Lijnkaart naar UADP

## Topologie

Catalyst 9400 - Macallan  
 SVI 100 IP: 100.100.100.1 / 24  
 SVI 100 MAC: 2c5a.0f1c.28e1



Neighbor device  
 SVI 100 IP: 100.100.100.53 / 24  
 SVI 100 MAC: 20bb.c05e.5351



<#root>

C9400#

show version

```
Cisco IOS XE Software, Version 16.06.01
Cisco IOS Software [Everest], Catalyst L3 Switch Software (CAT9K_IOSXE), Version 16.6.1, RELEASE SOFTWARE
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2017 by Cisco Systems, Inc.
Compiled Sat 22-Jul-17 05:51 by mcpre
--snip--
```

<#root>

C9400#

show module

Chassis Type: C9407R

Mod	Ports	Card Type	Model	Serial No.
1	48	48-Port 10/100/1000 (RJ-45)	C9400-LC-48T	JAE211703RC
2	48	48-Port UPOE 10/100/1000 (RJ-45)	C9400-LC-48U	JAE21150CGD
3	10	Supervisor 1 Module	C9400-SUP-1	JAE21240235
4	10	Supervisor 1 Module	C9400-SUP-1	JAE21240235
5	48	48-Port UPOE 10/100/1000 (RJ-45)	C9400-LC-48U	JAE21150CG9

Mod	MAC addresses	Hw	Fw	Sw	Status
1	E4AA.5D54.C84C to E4AA.5D54.C87B	0.6	16.6.1r [FC	16.06.01	ok
2	E4AA.5D54.B430 to E4AA.5D54.B45F	0.6	16.6.1r [FC	16.06.01	ok

```

3 2C5A.0F1C.28EC to 2C5A.0F1C.28F5 0.6 16.6.1r [FC 16.06.01 ok
4 2C5A.0F1C.28F6 to 2C5A.0F1C.28FF 0.6 16.6.1r [FC 16.06.01 ok
5 E4AA.5D54.B658 to E4AA.5D54.B687 0.6 16.6.1r [FC 16.06.01 ok

```

```

Mod Redundancy Role      Operating Redundancy Mode Configured Redundancy Mode
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
3  Active          sso                    sso
4  Standby         sso                    sso

```

<#root>

C9400#

show running-config interface port-channel 1

```

interface Port-channel1
switchport trunk allowed vlan 100
switchport mode trunk

```

<#root>

C9400#

show running-config interface gigabitEthernet 1/0/13

```

interface GigabitEthernet1/0/13
switchport trunk allowed vlan 100
switchport mode trunk
channel-group 1 mode active

```

<#root>

C9400#

show running-config interface gigabitEthernet 5/0/21

```

interface GigabitEthernet5/0/21
switchport trunk allowed vlan 100
switchport mode trunk
channel-group 1 mode active

```

<#root>

C9400#

show etherchannel summary

--snip--


```

Group Port-channel Protocol Ports
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
1      Po1(SU)         LACP   Gi1/0/13(P) Gi5/0/21(P)

```



---

 Opmerking: de opdrachten voor het showplatform kunnen vereisen dat de opdracht voor de interne globale configuratie van de service in de verklaring is opgenomen.

---

## Interfaceprogrammingering

### Toewijzing van interfaces met UADP 2.0-instanties

De opdracht voor interfaceprogrammingering geeft de interfacekaart op het voorpaneel voor alle lijnkaarten weer aan een van de 3 UADP 2.0-doorsturen ASIC op de actieve supervisor.

### Voorbeeld van uitgang

Dit voorbeeld laat zien dat:

- Interface Gig1/0/3 is verbonden met: UADP 2.0 intance 2 (UADP 2.0 Asic 1, Core 0) op de Supervisor.
- Interface Gig5/0/21 is verbonden met: UADP 2.0 intance 3 (UADP 2.0 Asic 1, Core 1) op de Supervisor.

```
<#root>
```

```
C9400#
```

```
show platform software fed active ifm mappings
```

Interface	IF_ID	Inst	Asic	Core	Port	SubPort	Mac	Cntx	LPN	GPN	Type	Active
GigabitEthernet1/0/1	0x7	2	1	0	0	0	4	4	1	101	NIF	Y
GigabitEthernet1/0/2	0x8	2	1	0	1	1	4	4	2	102	NIF	Y
--snip--												
GigabitEthernet1/0/13	0x13	2	1	0	12	4	0	0	13	1105	NIF	Y
--snip--												
GigabitEthernet5/0/21	0x8f	3	1	1	20	4	5	5	21	1104	NIF	Y
--snip--												

## Fysieke interfaceprogrammingering

Het bevel van het showplatform toont de details van de softwareconfiguratie voor Gig1/0/3 die op de waarde IF\_ID van het vorige bevelvoorbeeld wordt gebaseerd.

```
<#root>
```

```
C9400#
```

```
show platform software fed active ifm if-id 0x13
```

```
Interface IF_ID : 0x0000000000000013  
Interface Name : GigabitEthernet1/0/13  
Interface Block Pointer : 0x7fe5c5aab7b8
```

Interface State : READY  
Interface Status : ADD, UPD  
Interface Ref-Cnt : 7  
Interface Type : ETHER  
Port Type : SWITCH PORT  
Port Location : LOCAL  
Slot : 1  
Unit : 0  
Slot Unit : 13  
SNMP IF Index : 14  
GPN : 1105  
EC Channel : 1  
EC Index : 1  
Port Handle : 0x72000285  
LISP v4 Mobility : false  
LISP v6 Mobility : false  
QoS Trust Type : 0

Port Information

Handle ..... [0x72000285]  
Type ..... [Layer2]  
Identifier ..... [0x13]  
Slot ..... [1]  
Unit ..... [13]  
Port Physical Subblock  
Affinity ..... [local]  
Asic Instance ..... [2 (A:1,C:0)]  
AsicPort ..... [12]  
AsicSubPort ..... [4]  
MacNum ..... [0]  
ContextId ..... [0]  
LPN ..... [13]  
GPN ..... [113]  
Speed ..... [1GB]  
type ..... [NIF]  
PORT\_LE ..... [0x7fe5c5aabc28]  
L3IF\_LE ..... [0x0]  
EC GPN ..... [1105]  
EC L3IF\_LE ..... [0x0]  
EC Port Mask ..... [0xaaaaaaaaaaaaaaaa]  
DI ..... [0x7fe5c5ab5c48]  
Port L2 Subblock  
Enabled ..... [Yes]

Allow dot1q ..... [Yes] ---> interface Gig1/0/13 is configured as a trunk

Allow native ..... [Yes]  
Default VLAN ..... [1]  
Allow priority tag ... [Yes]  
Allow unknown unicast [Yes]  
Allow unknown multicast [Yes]  
Allow unknown broadcast [Yes]  
Allow unknown multicast [Enabled]  
Allow unknown unicast [Enabled]  
IPv4 ARP snoop ..... [No]  
IPv6 ARP snoop ..... [No]  
Jumbo MTU ..... [1500]  
Learning Mode ..... [1]  
Port QoS Subblock  
Trust Type ..... [0x2]  
Default Value ..... [0]  
Ingress Table Map ..... [0x0]

```

    Egress Table Map ..... [0x0]
    Queue Map ..... [0x0]
    Port Netflow Subblock
    Port Policy Subblock
    List of Ingress Policies attached to an interface
    List of Egress Policies attached to an interface
Ref Count : 7 (feature Ref Counts + 1)
IFM Feature Ref Counts
    FID : 100, Ref Count : 1
    FID : 57, Ref Count : 1
    FID : 115, Ref Count : 1
    FID : 17, Ref Count : 1
    FID : 78, Ref Count : 1
    FID : 30, Ref Count : 1
IFM Feature Sub block information
    FID : 57, Private Data : 0x7fe5c685e748
    FID : 17, Private Data : 0x7fe5c5e85f38
    FID : 30, Private Data : 0x7fe5c5e85aa8

```

Deze opdracht geeft de details van de hardwareconfiguratie weer voor Gig1/0/3, gebaseerd op de POORT\_LE-waarde uit de vorige opdracht.

Waarde	Definitie
Waarde 0	De waarde is niet ingesteld.
Waarde 1	De waarde wordt in de meeste gevallen ingesteld.

<#root>

C9400#

```
show platform hardware fed active fwd-asic abstraction print-resource-handle 0x7fe5c5aabc28 1
```

```
Handle:0x7fe5c5aabc28 Res-Type:ASIC_RSC_PORT_LE Res-Switch-Num:0 Asic-Num:2 Feature-ID:AL_FID_IFM Lkp-f
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index2:0xc mtu_index/13u_ri_index2:0x4 sm handle
```

Detailed Resource Information (ASIC#2)

-----

```

LEAD_PORT_ALLOW_BROADCAST value 1 Pass
LEAD_PORT_ALLOW_CAPWAP value 0 Pass
LEAD_PORT_ALLOW_CTS value 0 Pass
LEAD_PORT_ALLOW_DOT1Q_TAGGED value 1 Pass
LEAD_PORT_ALLOW_MULTICAST value 1 Pass
LEAD_PORT_ALLOW_NATIVE value 1 Pass
LEAD_PORT_ALLOW_NON_CTS value 0 Pass
LEAD_PORT_ALLOW_PRIORITY_TAGGED value 1 Pass
LEAD_PORT_ALLOW_UNICAST value 1 Pass
LEAD_PORT_ALLOW_UNKNOWN_ETHER_TYPE value 0 Pass
LEAD_PORT_ALLOW_UNKNOWN_UNICAST value 1 Pass
LEAD_PORT_ALLOW_VLAN_LOAD_BALANCE_GROUP value 15 Pass
LEAD_PORT_ALLOW_VRF value 0 Pass
LEAD_PORT_ARP_OR_ND_SNOOPING_ENABLED_IPV4 value 0 Pass

```

```

LEAD_PORT_ARP_OR_ND_SNOOPING_ENABLED_IPV6 value 0 Pass
LEAD_PORT_AUTH_MODE value 0 Pass
LEAD_PORT_CAPWAP_TUNNEL value 0 Pass
LEAD_PORT_CONTENT_MATCHING_ENABLED value 0 Pass
LEAD_PORT_CTS_ENABLED value 0 Pass
LEAD_PORT_CUSTOMER_PORT value 0 Pass
LEAD_PORT_DAI_OR_ND_TRUST_MODE_IPV4 value 0 Pass
LEAD_PORT_DAI_OR_ND_TRUST_MODE_IPV6 value 0 Pass
LEAD_PORT_DATA_GLEAN_LEARN_IPV4 value 0 Pass
--snip--

```

## EtherChannel-programmering

In deze Etherchannel programmeervoorbeeldoutputs programmeren de RP-programma's de FP, de FP-programma's de FED, de FED en vervolgens de Supervisor die ASIC-hardware doorstuurt. RP-softwaregegevens worden opgeslagen als objecten in de objectdatabase en de FP-softwaregegevens worden opgeslagen als asynchrone objecten in de objectdatabase.

<#root>

C9400#

show etherchannel summary

--snip--

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Gi1/0/13(P) Gi5/0/21(P)

Group Mask is een non-zero in deze output. Het wordt gebruikt in het hashproces om de link in het etherkanaal te bepalen waar een verkeersstroom uitkomt.

<#root>

C9400#

show platform software interface rp active brief

Forwarding Manager Interfaces Information

Name	ID	QFP ID
Null0	1	0
GigabitEthernet1/0/1	7	0
GigabitEthernet1/0/2	8	0
GigabitEthernet1/0/3	9	0
-snip-		
GigabitEthernet1/0/13	19	0
-snip-		
GigabitEthernet5/0/21	143	0
-snip-		
Port-channel1	748	0

-snip-

<#root>

C9400#

show platform software fed active etherchannel 1 group-mask

Group Mask Info

Aggport IIF Id: 00000000000002EC ---> hex 0x2EC = dec 748

Active Port: : 2 -----> 2 active interfaces in the etherchannel = the Member ports below

Member Ports

If Name	If Id	local	Group Mask
GigabitEthernet1/0/13	0000000000000013	true	5555555555555555 ---> hex 0x13 = dec 19
GigabitEthernet5/0/21	000000000000008f	true	aaaaaaaaaaaaaaaa ---> hex 0x8f = dec 143

Dit bevel toont de configuratie voor poortkanaal 1:

<#root>

C9400#

show platform software fed active ifm if-id 0x000002ec

Interface IF\_ID : 0x00000000000002ec  
Interface Name : Port-channel1  
Interface Block Pointer : 0x7fe5c685df98  
Interface State : READY  
Interface Status : ADD, UPD  
Interface Ref-Cnt : 5  
Interface Type : ETHERCHANNEL  
Port Type : SWITCH PORT  
Channel Number : 1  
SNMP IF Index : 720  
Port Handle : 0x50002f6  
#Of Active Ports : 2  
Base GPN : 1104  
Index[2] : 00000000000000

13 ---> Gig1/0/13 from previous command output

Index[3] : 00000000000000

8f ---> Gig5/0/21 from previous command output

Port Information

Handle ..... [0x50002f6]  
Type ..... [L2-Ethchannel]  
Identifier ..... [0x2ec]  
Unit ..... [1]  
Port Logical Subblock  
L3IF\_LE handle .... [0x0]  
Num physical port . [2]  
GPN Base ..... [1104]

```

Num physical port on asic [0] is [0]
DiBcam handle on asic [0].... [0x0]
Num physical port on asic [1] is [0]
DiBcam handle on asic [1].... [0x0]

Num physical port on asic [2] is [1] -----> Gig1/0/13 is on ASIC instance 2 (Supervisor ASIC 1, c
DiBcam handle on asic [2].... [0x7fe5c6ae3608]

Num physical port on asic [3] is [1] -----> Gig5/0/21 is on ASIC instance 3 (Supervisor ASIC 1, c

DiBcam handle on asic [3].... [0x7fe5c685d7e8]
Num physical port on asic [4] is [0]
DiBcam handle on asic [4].... [0x0]
Num physical port on asic [5] is [0]
DiBcam handle on asic [5].... [0x0]
Port L2 Subblock
Enabled ..... [No]
Allow dot1q ..... [No]
Allow native ..... [No]
Default VLAN ..... [0]
Allow priority tag ... [No]
Allow unknown unicast [No]
Allow unknown multicast[No]
Allow unknown broadcast[No]
Allow unknown multicast[Enabled]
Allow unknown unicast [Enabled]
IPv4 ARP snoop ..... [No]
IPv6 ARP snoop ..... [No]
Jumbo MTU ..... [0]
Learning Mode ..... [0]
Port QoS Subblock
Trust Type ..... [0x7]
Default Value ..... [0]
Ingress Table Map ..... [0x0]
Egress Table Map ..... [0x0]
Queue Map ..... [0x0]
Port Netflow Subblock
Port Policy Subblock
List of Ingress Policies attached to an interface
List of Egress Policies attached to an interface
Ref Count : 5 (feature Ref Counts + 1)
IFM Feature Ref Counts
FID : 115, Ref Count : 1
FID : 78, Ref Count : 1
No Sub Blocks Present

```

Dit bevel toont de configuratie voor afbeeldingsinterfaces.

Afkorting/instantie	Definitie
IFM	Interfacebeheer
instantie	Gig1/0/13 wordt uitgevoerd op ASIC-instantie 2 (UADP 2.0 ASIC 1, core 0) met interface-ID 0x13

instantie	Gig5/0/21 staat op ASIC-instantie 3 (UADP 2.0 ASIC 1, core 1) met interface-ID 0x8f
-----------	-------------------------------------------------------------------------------------

<#root>

C9400#

show platform software fed active ifm mappings

Interface	IF_ID	Inst	Asic	Core	Port	SubPort	Mac	Cntx	LPN	GPN	Type	Active
GigabitEthernet1/0/1	0x7	2	1	0	0	0	4	4	1	101	NIF	Y
GigabitEthernet1/0/2	0x8	2	1	0	1	1	4	4	2	102	NIF	Y
--snip--												
GigabitEthernet1/0/13	0x13	2	1	0	12	4	0	0	13	1105	NIF	Y
--snip--												
GigabitEthernet5/0/21	0x8f	3	1	1	20	4	5	5	21	1104	NIF	Y
--snip--												

## Wereldwijde Ethernet-configuratie

<#root>

C9400#

show platform software ether-channel rp active global-config

Forwarding Manager EtherChannel Global Configuration Information

Frame Dist Method:

Dest-IP-Address ---> distribution (hash) method: a packet's destination IP address is used to determine

<#root>

C9400#

show platform software ether-channel fp active global-config

Forwarding Manager EtherChannel Global Configuration Information

Frame Dist Method: Dest-IP-Address

AOM ID: 27

Status:

Done -----> Programming in hardware is complete (FP received acknowledgement from FED)

<#root>

C9400#





---> ASIC instance 2 = Supervisor ASIC 1, core 0

-----  
LEAD\_VLAN\_ALLOW\_SNOOPING\_IGMP\_OR\_MLD\_IPV4 value 0 Pass  
LEAD\_VLAN\_ALLOW\_SNOOPING\_IGMP\_OR\_MLD\_IPV6 value 0 Pass  
LEAD\_VLAN\_ARP\_OR\_ND\_SNOOPING\_ENABLED\_IPV4 value 0 Pass  
LEAD\_VLAN\_ARP\_OR\_ND\_SNOOPING\_ENABLED\_IPV6 value 0 Pass  
LEAD\_VLAN\_BLOCK\_L2\_LEARN value 0 Pass  
LEAD\_VLAN\_CONTENT\_MATCHING\_ENABLED value 0 Pass  
LEAD\_VLAN\_DEST\_MOD\_INDEX\_TVLAN\_LE value 0 Pass  
LEAD\_VLAN\_DHCP\_SNOOPING\_ENABLED\_IPV4 value 0 Pass  
LEAD\_VLAN\_DHCP\_SNOOPING\_ENABLED\_IPV6 value 0 Pass  
LEAD\_VLAN\_ENABLE\_SECURE\_VLAN\_LEARNING\_IPV4 value 0 Pass  
LEAD\_VLAN\_ENABLE\_SECURE\_VLAN\_LEARNING\_IPV6 value 0 Pass  
LEAD\_VLAN\_EPOCH value 0 Pass  
LEAD\_VLAN\_L2\_PROCESSING\_STP\_TCN value 0 Pass  
LEAD\_VLAN\_L2FORWARD\_IPV4\_MULTICAST\_PKT value 0 Pass  
LEAD\_VLAN\_L2FORWARD\_IPV6\_MULTICAST\_PKT value 0 Pass  
LEAD\_VLAN\_L3\_IF\_LE\_INDEX\_PRIO value 1 Pass  
LEAD\_VLAN\_L3IF\_LE\_INDEX value 111 Pass  
  
LEAD\_VLAN\_LOOKUP\_VLAN value 10 Pass -----> MVID 10 = vlan 100  
  
LEAD\_VLAN\_MCAST\_LOOKUP\_VLAN value 10 Pass  
LEAD\_VLAN\_RIET\_OFFSET value 1 Pass  
LEAD\_VLAN\_SNOOPING\_FLOODING\_ENABLED\_IGMP\_OR\_MLD\_IPV4 value 0 Pass  
LEAD\_VLAN\_SNOOPING\_FLOODING\_ENABLED\_IGMP\_OR\_MLD\_IPV6 value 1 Pass  
LEAD\_VLAN\_SNOOPING\_PROCESSING\_STP\_TCN\_IGMP\_OR\_MLD\_IPV4 value 0 Pass  
LEAD\_VLAN\_SNOOPING\_PROCESSING\_STP\_TCN\_IGMP\_OR\_MLD\_IPV6 value 0 Pass  
LEAD\_VLAN\_VLAN\_CLIENT\_LABEL value 0 Pass  
LEAD\_VLAN\_VLAN\_CONFIG value 0 Pass  
LEAD\_VLAN\_VLAN\_FLOOD\_ENABLED value 0 Pass  
LEAD\_VLAN\_VLAN\_ID\_VALID value 1 Pass  
LEAD\_VLAN\_VLAN\_LOAD\_BALANCE\_GROUP value 15 Pass  
LEAD\_VLAN\_VLAN\_ROLE value 0 Pass  
LEAD\_VLAN\_VLAN\_FLOOD\_MODE\_BITS value 3 Pass  
LEAD\_VLAN\_LVX\_VLAN value 0 Pass  
LEAD\_VLAN\_EGRESS\_DEJAVU\_CANON value 0 Pass  
LEAD\_VLAN\_EGRESS\_INGRESS\_VLAN\_MODE value 0 Pass  
LEAD\_VLAN\_EGRESS\_LOOKUP\_VLAN value 0 Pass  
LEAD\_VLAN\_EGRESS\_SGACL\_DISABLED value 3 Pass  
LEAD\_VLAN\_EGRESS\_VLAN\_CLIENT\_LABEL value 0 Pass  
LEAD\_VLAN\_EGRESS\_VLAN\_ID\_VALID value 1 Pass  
LEAD\_VLAN\_EGRESS\_VLAN\_LOAD\_BALANCE\_GROUP value 15 Pass  
LEAD\_VLAN\_EGRESS\_INTRA\_POD\_BCAST value 0 Pass  
LEAD\_VLAN\_EGRESS\_INTER\_POD\_BCAST value 0 Pass  
LEAD\_VLAN\_MAX value 0 Pass

Detailed Resource Information (ASIC#3)

---> ASIC instance 3 = Supervisor ASIC 1, core 1

--snip--

Detailed Resource Information (ASIC#4)

---> ASIC instance 4 = Supervisor ASIC 2, core 0

--snip-

Detailed Resource Information (ASIC#5)

---> ASIC instance 5 = Supervisor ASIC 2, core 1

--snip--

# Spanning Tree-programmering

<#root>

C9400#

show spanning-tree vlan 100

VLAN0100

```
Spanning tree enabled protocol rstp
Root ID    Priority    32868
           Address    20bb.c05e.5300
           Cost      4
           Port      2473 (Port-channel1)
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    32868 (priority 32768 sys-id-ext 100)
           Address    2c5a.0f1c.28c0
           Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
           Aging Time 300 sec
```

Interface	Role	Sts	Cost	Prio.Nbr	Type
Gi1/0/1	Desg	FWD	19	128.1	Shr
Gi2/0/11	Desg	FWD	4	128.107	P2p
Po1	Root	FWD	3	128.2473	P2p Peer(STP)

<#root>

C9400#

show etherchannel summary

--snip--

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Gi1/0/13(P) Gi5/0/21(P)

Deze opdrachten geven de overspannende boomstructuur weer voor Port-channel 1.

<#root>

C9400#

show platform software interface rp active brief

Forwarding Manager Interfaces Information

```

Name                               ID           QFP ID
-----
Null0                               1           0
GigabitEthernet1/0/1               7           0
GigabitEthernet1/0/2               8           0
GigabitEthernet1/0/3               9           0
--snip--
Port-channel1                       748         0
--snip--

```

<#root>

C9400#

show platform software fed active vp summary interface if\_id 748

```

          if_id      vlan_id  pvlan_mode  pvlan_vlan  stp_state  vtp pruned      Untagged
-----
          748        100      trunk           1 forwarding      No           No

```

De volgende opdrachten geven de overspannende hardwarestatus voor VLAN 100 weer.

<#root>

C9400#

show platform software fed active vp summary vlan 100

```

          if_id      vlan_id  pvlan_mode  pvlan_vlan  stp_state  vtp pruned      Untagged
-----
--snip--
          748 100      trunk           1 forwarding      No           No
--snip--

```

<#root>

C9400#

show platform hardware fed active vlan 100 ingress

VLAN STP State in hardware

vlan id is:: 100

Interfaces in forwarding state: : Gi2/0/11(Tagged), Gi1/0/1(Tagged), Gi1/0/13(Tagged), Gi5/0/21(Tagged)  
flood list: : Gi2/0/11, Gi1/0/1, Gi1/0/13, Gi5/0/21

<#root>

C9400#

```
show platform hardware fed active vlan 100 egress
```

VLAN STP State in hardware

vlan id is:: 100

Interfaces in forwarding state: : Gi2/0/11(Tagged), Gi1/0/1(Tagged), Gi1/0/13(Tagged), Gi5/0/21(Tagged)

Controleer of de Spanning-Tree-stabiliteit is gegarandeerd. Zorg ervoor dat de meldingen voor topologiewijzigingen (TCN) niet vaak worden weergegeven.

<#root>

C9400#

```
show spanning-tree vlan 100 detail
```

```
VLAN0100 is executing the rstp compatible Spanning Tree protocol
Bridge Identifier has priority 32768, sysid 10, address 2c5a.0f1c.28c0
Configured hello time 2, max age 20, forward delay 15, transmit hold-count 6
Current root has priority 32868, address 2c5a.0f1c.5300
Root port is 2473 (Port-channel1), cost of root path is 4
Topology change flag not set, detected flag not set
Number of topology changes 1 last change occurred 2w6d ago
    from Port-channel1
Times: hold 1, topology change 35, notification 2
    hello 2, max age 20, forward delay 15
Timers: hello 0, topology change 0, notification 0, aging 300
```

--snip--

## L2 doorsturen van programma's

<#root>

C9400#

```
show etherchannel summary
```

--snip--

Group	Port-channel	Protocol	Ports
1	Po1(SU)	LACP	Gi1/0/13(P) Gi5/0/21(P)

<#root>

C9400#

```
ping 100.100.900.53
```

```
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 100.100.900.53, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 3/4/5 ms
```

```
<#root>
```

```
C9400#
```

```
show mac address-table dynamic vlan 100
```

```
Mac Address Table
```

```
-----
```

Vlan	Mac Address	Type	Ports
100	0000.0200.0800	DYNAMIC	Gi1/0/1
100	20bb.c05e.5318	DYNAMIC	Po1
100	20bb.c05e.5351	DYNAMIC	Po1

Total Mac Addresses for this criterion: 3

## Softwareprogramming

In de volgende outputvoorbeelden programmeert de RP het FP, de FP programma's de FED, de FED en uiteindelijk de Supervisor die ASIC hardware doorstuurt. RP softwareMAC-vermeldingen worden opgeslagen als objecten in de objectdatabase en de FP softwareMAC-vermeldingen worden opgeslagen als asynchrone objecten in de objectdatabase.

```
<#root>
```

```
C9400#
```

```
show platform software matm rp active mac 20bb.c05e.5351 1 100 ---> 100 = vlan
```

Tbl_Type	Tbl_ID	MAC_Address	Type	Ports	AOM_ID/OM_PTR
MAT_VLAN	100	20bb.c05e.5351	1	1	OM: 0x3700860010

List of Ports: 748

```
<#root>
```

```
C9400#
```

```
show platform software interface rp active brief
```

```
Forwarding Manager Interfaces Information
```

Name	ID	QFP ID
Null0	1	0
GigabitEthernet1/0/1	7	0
GigabitEthernet1/0/2	8	0

```
GigabitEthernet1/0/3          9          0
-snip-
Port-channel1                 748        0
-snip-
```

<#root>

C9400#

show platform software matm fp active mac 20bb.c05e.5351

```
Tbl_Type  Tbl_ID    MAC_Address  Type  Ports  AOM_ID/OM_PTR
MAT_VLAN   100 20bb.c05e.5351  1    1  6567 created
List of Ports: 748
```

<#root>

C9400#

show platform software object-manager fp active object 6567

Object identifier: 6567

Description: matm mac entry type VLAN, id 100, 20bb.c05e.5351  
Status: Done, Epoch: 0, Client data: 0x799633f8

## Hardware Programming - Methode 1

<#root>

C9400#

show platform softwarefed active matm macTable vlan 100

VLAN MAC

Type

```
Seq#  macHandle      siHandle      diHandle      *a_time  *e_time  ports
100   2c5a.0f1c.28e1  0X8002 0      0x7fe5c5eaf1c8 0x7fe5c5924f38 0x0      0      0      Vlan100
100   20bb.c05e.5351
```

0x1

```
589  0x7fe5c6b03d68 0x7fe5c6865f78 0x7fe51001b458 300      1      Port-channel1
100  0000.0200.0800 0X1      610  0x7fe5c6b07888 0x7fe5c6b076e8 0x7fe5c5972ce8 300      1      GigabitE
```

Total Mac number of addresses:: 3

\*a\_time=aging\_time(secs) \*e\_time=total\_elapsed\_time(secs)

Type:

MAT\_DYNAMIC\_ADDR 0x1

MAT\_STATIC\_ADDR

0x2 ---> Type = dynamically learned MAC address entry

MAT_CPU_ADDR	0x4	MAT_DISCARD_ADDR	0x8
MAT_ALL_VLANS	0x10	MAT_NO_FORWARD	0x20
MAT_IPMULT_ADDR	0x40	MAT_RESYNC	0x80
MAT_DO_NOT_AGE	0x100	MAT_SECURE_ADDR	0x200
MAT_NO_PORT	0x400	MAT_DROP_ADDR	0x800
MAT_DUP_ADDR	0x1000	MAT_NULL_DESTINATION	0x2000
MAT_DOT1X_ADDR	0x4000	MAT_ROUTER_ADDR	0x8000
MAT_WIRELESS_ADDR	0x10000	MAT_SECURE_CFG_ADDR	0x20000
MAT_OPO_DATA_PRESENT	0x40000	MAT_WIRED_TUNNEL_ADDR	0x80000
MAT_DLR_ADDR	0x100000	MAT_MRP_ADDR	0x200000
MAT_MSRRP_ADDR	0x400000	MAT_LISP_LOCAL_ADDR	0x800000
MAT_LISP_REMOTE_ADDR	0x1000000	MAT_VPLS_ADDR	0x2000000

### macHandle-programmeren

Afkorting/term	Definitie
VLAN's:10	MVID 10. VLAN 1000 gebruikt intern toegewezen VLAN-id (MVID) 10 binnen de switch.
GPN:1104	Wereldwijd poortnummer van Port-Channel 1.
MC: 20x20bbc05e5351	MAC-adres 20bb.c05e.5351

Dit is een macHandle-uitvoervoorbeeld:

<#root>

C9400#

```
show platform hardware fed active fwd-asic abstraction print-resource-handle 0x7fe5c6b03d68 1
```

```
Handle:0x7fe5c6b03d68 Res-Type:ASIC_RSC_HASH_TCAM Res-Switch-Num:0 Asic-Num:255 Feature-ID:AL_FID_L2 Lk
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: handle [ASIC: 0]: 0x7fe5c6aed898 handle [ASIC: 1]
Features sharing this resource:Cookie length: 12
5e c0 bb 20 51 53 0a 80 07 00 00 00
```

Detailed Resource Information (ASIC#0)

-----  
Number of HTM Entries: 1

Entry 0: (handle 0x7fe5c6aed898)

Abs\_hash\_index: 294

KEY - vlan:10 mac:0x20bbc05e5351 l3\_if:0 gpn:1104 epoch:0 static:0 flood\_en: 0 vlan\_lead\_wless\_flood\_en  
MASK - vlan:0 mac:0x0 l3\_if:0 gpn:0 epoch:0 static:0 flood\_en:0 vlan\_lead\_wless\_flood\_en: 0 client\_home  
SRC\_AD - need\_to\_learn:0 lrn\_v:0 catchall:0 static\_mac:0 chain\_ptr\_v:0 chain\_ptr: 0 static\_entry\_v:0 au  
DST\_AD - si:0xcd bridge:0 replicate:0 blk\_fwd\_o:0 v4\_rmac:0 v6\_rmac:0 catchall:0 ign\_src\_lrn:0 port\_mas

Detailed Resource Information (ASIC#1)

--snip--

Detailed Resource Information (ASIC#2)

--snip--

<#root>

C9400#

show platform software fed active vlan 100

VLAN Fed Information

Vlan Id	IF Id	LE Handle	STP Handle	L3 IF Handle	SVI IF ID
100	0x0000000000420011	0x00007fe5c4616ef8	0x00007fe5c4617778	0x00007fe5c50dac28	0x00000000000002ea

<#root>

C9400#

show platform software fed active ifm mappings etherchannel

Mappings Table

Chan	Interface	IF_ID
1	Port-channel1	0x000002ec

--snip--

<#root>

C9400#

show platform software fed active ifm if-id 0x000002ec <-- IF\_ID from previous output


Interface IF\_ID : 0x00000000000002ec  
Interface Name : Port-channel1  
Interface Block Pointer : 0x7fe5c685df98  
Interface State : READY  
Interface Status : ADD, UPD  
Interface Ref-Cnt : 5  
Interface Type : ETHERCHANNEL  
Port Type : SWITCH PORT  
Channel Number : 1  
SNMP IF Index : 720  
Port Handle : 0x50002f6  
#Of Active Ports : 2  
Base GPN : 1104



```
Index[2] : 0000000000000013
Index[3] : 000000000000008f
```

```
Port Information
Handle ..... [0x50002f6]
Type ..... [L2-Ethchannel]
Identifier ..... [0x2ec]
Unit ..... [1]
Port Logical Subblock
L3IF_LE handle .... [0x0]
Num physical port . [2]
GPN Base ..... [1104]
--snip--
```

---

 **Opmerking:** de interface waar de mac op leerde was een enkele interface in plaats van een poortkanaal, deze opdracht wordt gebruikt om te bepalen GPN naar interfacekaart

---

```
<#root>
```

```
C9400#
```

```
show platform software fed active ifm mappings gpn
```

```
Mappings Table
```

```
GPN  Interface                IF_ID
-----
101  GigabitEthernet1/0/1      0x00000007
102  GigabitEthernet1/0/2      0x00000008
103  GigabitEthernet1/0/3      0x00000009
--snip--
```

## Handmatige programmering

Afkorting/term	Definitie				
Sihandle	station index Handvat. Het pakket herschrijft info (RI = Rewrite Index) & uitgaande interfaceinfo (DI = Destination Index).				
Afbeelding van Bitmap voor dual core op single Supervisor ASIC:					
	<table border="1"> <tr> <td>Afkorting/term</td> <td>Definitie</td> </tr> <tr> <td>Lokale ASIC (LD = Lokale</td> <td>Bestemming op dezelfde ASIC, dezelfde kern als bron.</td> </tr> </table>	Afkorting/term	Definitie	Lokale ASIC (LD = Lokale	Bestemming op dezelfde ASIC, dezelfde kern als bron.
Afkorting/term	Definitie				
Lokale ASIC (LD = Lokale	Bestemming op dezelfde ASIC, dezelfde kern als bron.				

	gegevens)	
	Core-kopie (CD = Core- gegevens	Bestemming op dezelfde ASIC, een andere kern.
	Remote ASIC (RD = gegevens op afstand)	Bestemming op een andere ASIC.

<#root>

C9400#

```
show platform hardware fed active fwd-asic abstraction print-resource-handle 0x7fe5c6865f78 1
```

```
Handle:0x7fe5c6865f78 Res-Type:ASIC_RSC_SI Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_L3_UNICAST_priv_ri/priv_si Handle: 0x7fe5c6864938Hardware Indices/Handles: index0:0xcd mtu_index/13u_ri_index0:0x0 Features sharing this resource:64 (1)] 55 (1)]
```

```
Cookie length: 56
00 00 00 00 00 00 00 00 64 00 00 00 00 00 00 00 00 00 00 00 07 00 20 bb c0 5e 53 51 00 00 00 00 00 00 00 00
```

Detailed Resource Information (ASIC#0)

```
---> ASIC instance 0 = Supervisor ASIC 0, core 0
```

-----

Station Index (SI) [0xcd]

```
RI = 0x29 -----> Rewrite index (no MAC rewrite for L2 forwarding)
```

```
DI = 0x51c2 -----> Destination index = outgoing interface
```

```
stationTableGenericLabel = 0
stationFdConstructionLabel = 0
lookupSkipIdIndex = 0
rcpServiceId = 0
dejaVuPreCheckEn = 0x1
Replication Bitmap: LD RD CD
```

Detailed Resource Information (ASIC#1)

```
---> ASIC instance 1 = Supervisor ASIC 0, core 1
```

--snip--

Detailed Resource Information (ASIC#2)

```
---> ASIC instance 2 = Supervisor ASIC 1, core 0
```

--snip--

Detailed Resource Information (ASIC#3)

```
---> ASIC instance 3 = Supervisor ASIC 1, core 1
```

```
--snip--
Detailed Resource Information (ASIC#4)
---> ASIC instance 4 = Supervisor ASIC 2, core 0
--snip--
Detailed Resource Information (ASIC#5)
---> ASIC instance 5 = Supervisor ASIC 2, core 1
--snip--
```

<#root>

C9400#

```
show platform hardware fed active fwd-asic resource asic all destination-index range 0x51c2 0x51c2
```

```
ASIC#0:
--snip--
ASIC#1:
--snip--
```

```
ASIC#2: -----> ASIC Instance 2 = Supervisor ASIC 1, core 0
```

```
Destination Index (DI) [0x51c2]
portMap =
```

```
0x00000000 00001000 ---> binary 0001 0000 0000 0000 = Port 12 (see next command output)
```

```
cmi1 = 0
```

```
(read right to left, zero based)
```

```
rcpPortMap = 0
CPU Map Index (CMI) [0]
ctiLo0 = 0
ctiLo1 = 0
ctiLo2 = 0
cpuQNum0 = 0
cpuQNum1 = 0
cpuQNum2 = 0
npuIndex = 0
stripSeg = 0
copySeg = 0
```

```
ASIC#3: -----> ASIC instance 3 = Supervisor ASIC 1, core 1
```

```
Destination Index (DI) [0x51c2]
portMap =
```

```
0x00000000 00100000 ---> binary 0001 0000 0000 0000 0000 0000 = Port 20 (see next command output)
```

```
cmi1 = 0
```

```
(read right to left, zero based)
```

```
rcpPortMap = 0
CPU Map Index (CMI) [0]
ctiLo0 = 0
ctiLo1 = 0
```

```
ctiLo2 = 0
cpuQNum0 = 0
cpuQNum1 = 0
cpuQNum2 = 0
npuIndex = 0
stripSeg = 0
copySeg = 0
```

```
ASIC#4:
--snip--
ASIC#5:
--snip--
```

<#root>

C9400#

```
show platform software fed active ifm mappings
```

Interface	IF_ID	Inst	Asic	Core	Port	SubPort	Mac	Cntx	LPN	GPN	Type	Active
GigabitEthernet1/0/1	0x7	2	1	0	0	0	4	4	1	101	NIF	Y
GigabitEthernet1/0/2	0x8	2	1	0	1	1	4	4	2	102	NIF	Y
--snip--												
GigabitEthernet1/0/13	0x13	2	1	0	12	4	0	0	13	1105	NIF	Y
--snip--												
GigabitEthernet5/0/21	0x8f	3	1	1	20	4	5	5	21	1104	NIF	Y
--snip--												

<#root>

C9400#

```
show etherchannel summary
```

```
--snip--
Group Port-channel Protocol Ports
-----+-----+-----+-----
1 Po1(SU) LACP Gi1/0/13(P) Gi5/0/21(P)
```

Er is geen verwachte MAC rewrite informatie omdat dit een Layer 2 MAC-doorsturen is.

<#root>

C9400#

```
show platform hardware fed active fwd-asic resource asic all rewrite-index range 0x29 0x29 1
```

```
ASIC#0:
```

```
Rewrite Data Table Entry,
ASIC#:0, rewrite_type:1,
```

```
RI:41 ----> dec 41 = hex 0x29
```

MAC Addr:  
MAC Addr: 20:bb:c0:5e:53:51,  
L3IF LE Index 111

ASIC#1:

Rewrite Data Table Entry,  
ASIC#:1, rewrite\_type:1, RI:41

MAC Addr:  
MAC Addr: 20:bb:c0:5e:53:51,  
L3IF LE Index 111

ASIC#2:

--snip--

ASIC#3:

--snip--

ASIC#4:

--snip--

ASIC#5:

--snip--

<#root>

C9400#

show mac address-table address 20bb.c05e.5351

Mac Address Table

```
-----  
Vlan    Mac Address      Type      Ports  
----    -  
100     20bb.c05e.5351  DYNAMIC  Po1  
Total Mac Addresses for this criterion: 1
```

## Handle-programmeren

acroniem	Definitie
stopcontact	bestemmings index Handvat. Dit is de uitgaande interface-informatie.

<#root>

C9400#

show platform hardware fed active fwd-asic abstraction print-resource-handle 0x7fe51001b458 1

Handle:0x7fe51001b458 Res-Type:ASIC\_RSC\_DI Res-Switch-Num:0 Asic-Num:255 Feature-ID:AL\_FID\_INVALID Lkp-priv\_ri/priv\_si Handle: (nil)Hardware Indices/Handles: index0:0x51c2 mtu\_index/13u\_ri\_index0:0x0 index1  
Features sharing this resource:Cookie length: 8

01 00 00 00 c2 51 00 00

Detailed Resource Information (ASIC#0)

--snip--

Detailed Resource Information (ASIC#1)

--snip--

Detailed Resource Information (ASIC#2)

---> ASIC Instance 2 = Supervisor ASIC 1, core 0

-----  
Destination Index (DI) [0x51c2]

portMap =

0x00000000 00001000 -----> binary 0001 0000 0000 0000 = Port 12 (see next command output)

cmi1 = 0 (

read right to left, zero based)

rcpPortMap = 0

CPU Map Index (CMI) [0]

ctiLo0 = 0

ctiLo1 = 0

ctiLo2 = 0

cpuQNum0 = 0

cpuQNum1 = 0

cpuQNum2 = 0

npuIndex = 0

stripSeg = 0

copySeg = 0

Detailed Resource Information (ASIC#3)

---> ASIC Instance 3 = Supervisor ASIC 1, core 1

-----  
Destination Index (DI) [0x51c2]

portMap =

0x00000000 00100000 ---> binary 0001 0000 0000 0000 0000 0000 = Port 20 (see next command output)

cmi1 = 0

(read right to left, zero based)

rcpPortMap = 0

CPU Map Index (CMI) [0]

ctiLo0 = 0

ctiLo1 = 0

ctiLo2 = 0

cpuQNum0 = 0

cpuQNum1 = 0

cpuQNum2 = 0

npuIndex = 0

stripSeg = 0

copySeg = 0

Detailed Resource Information (ASIC#4)

--snip--

Detailed Resource Information (ASIC#5)

--snip--

<#root>

C9400#

show platform software fed active ifm mappings

```
Interface          IF_ID Inst Asic Core Port SubPort Mac Cntx LPN GPN Type Active
GigabitEthernet1/0/1 0x7  2  1  0  0  0      4  4  1  101 NIF Y
GigabitEthernet1/0/2 0x8  2  1  0  1  1      4  4  2  102 NIF Y
--snip--
GigabitEthernet1/0/13 0x13 2  1  0  12  4      0  0  13 1105 NIF Y
--snip--
GigabitEthernet5/0/21 0x8f 3  1  1  20  4      5  5  21 1104 NIF Y
--snip--
```

<#root>

C9400#

show etherchannel summary

```
--snip--
Group Port-channel Protocol Ports
-----+-----+-----+-----
1 Po1(SU) LACP Gi1/0/13(P) Gi5/0/21(P)
```

## Hardware Programming - Methode 2

Afkorting/term	Definitie
VLAN's:10	MVID 10. VLAN 1000 gebruikt intern toegewezen VLAN-id (MVID) 10 binnen de switch.
GPN:1104	Wereldwijd poortnummer van Port-Channel 1.
MC: 20x20bbc05e5351	MAC-adres 20bb.c05e.5351

Hardware programmeermethode 2 voorbeeld uitvoer:

<#root>

C9400#

show platform hardware fed active matm macTable vlan 100

--snip--

HEAD: MAC address 20bb.c05e.5351 in VLAN 100

KEY: vlan 10, mac 0x20bbc05e5351, l3\_if 0, gpn 1104, epoch 0, static 0, flood\_en 0, vlan\_lead\_wless\_flood\_en 0

MASK: vlan 0, mac 0x0, l3\_if 0, gpn 0, epoch 0, static 0, flood\_en 0, vlan\_lead\_wless\_flood\_en 0, client\_learn 0

SRC\_AD: need\_to\_learn 0, lrn\_v 0, catchall 0, static\_mac 0, chain\_ptr\_v 0, chain\_ptr 0, static\_entry\_v 0, static\_mac 0

DST\_AD: si 0xc7, bridge 0, replicate 0, blk\_fwd\_o 0, v4\_mac 0, v6\_mac 0, catchall 0, ign\_src\_lrn 0, port 0

--snip--

<#root>

C9400#

show platform software fed active vlan 100

VLAN Fed Information

Vlan Id	IF Id	LE Handle	STP Handle	L3 IF Handle	SVI IF ID
100	0x000000000420011	0x00007fe5c4616ef8	0x00007fe5c4617778	0x00007fe5c50dac28	0x00000000000002ea

<#root>

C9400#

show platform software fed active ifm mappings etherchannel

Mappings Table

Chan	Interface	IF_ID
1	Port-channel1	0x000002ec

--snip--

<#root>

C9400#

show platform software fed active ifm if-id 0x000002ec

Interface IF\_ID : 0x00000000000002ec

Interface Name : Port-channel1

Interface Block Pointer : 0x7fe5c685df98

Interface State : READY

Interface Status : ADD, UPD

Interface Ref-Cnt : 5

Interface Type : ETHERCHANNEL

Port Type : SWITCH PORT

Channel Number : 1

SNMP IF Index : 720

Port Handle : 0x50002f6

#Of Active Ports : 2

Base GPN : 1104


Index[2] : 0000000000000013

Index[3] : 000000000000008f



```
Port Information
Handle ..... [0x50002f6]
Type ..... [L2-Ethchannel]
Identifier ..... [0x2ec]
Unit ..... [1]
Port Logical Subblock
L3IF_LE handle .... [0x0]
Num physical port . [2]
GPN Base ..... [1104]
--snip--
```

---

 **Opmerking:** Als de interface waar de Mac op heeft geleerd één interface was in plaats van een poortkanaal, wordt de volgende opdracht gebruikt om de gpn-naar-interfacekaart te bepalen:

---

```
<#root>
```

```
C9400#
```

```
show platform software fed active ifm mappings gpn
```

```
Mappings Table
```

GPN	Interface	IF_ID
101	GigabitEthernet1/0/1	0x00000007
102	GigabitEthernet1/0/2	0x00000008
103	GigabitEthernet1/0/3	0x00000009

```
--snip--
```

## TCAM-gebruik

Controleer het TCAM-gebruik voor de MAC-adresvermeldingen op elke Supervisor ASIC-instantie om er zeker van te zijn dat de switch geen TCAM-ruimte heeft om vermeldingen in de hardware op te slaan.

```
<#root>
```

```
C9400
```

```
show platform hardware fed active fwd-asic resource tcam utilization
```

```
CAM Utilization for ASIC Instance [0]
```

```
--snip--
```

```
CAM Utilization for ASIC Instance [1]
```

```
--snip--
```

```
CAM Utilization for ASIC Instance [2]
```

```
--snip--
```

```
CAM Utilization for ASIC Instance [3]---> ASIC instance 3 = Supervisor ASIC 1, Core 1
```

Table	Max Values	Used Values
-----		
Unicast MAC addresses	65536/1024	
13/1 -----> prefix/mask		
IGMP and Multicast groups	16384/1024	0/7
L2 Multicast groups	16384/1024	1/9
Directly or indirectly connected routes	49152/65536	0/0
NAT/PAT SA address and Port	0	0
QoS Access Control Entries	18432	34
Security Access Control Entries	18432	0
Ingress Netflow ACEs	1024	0
Policy Based Routing ACEs	2048	9
Egress Netflow ACEs	2048	8
Input Microflow policer ACEs	0	0
Output Microflow policer ACEs	0	0
Flow SPAN ACEs	1024	13
Control Plane Entries	1024	0
Tunnels	1024	0
Lisp Instance Mapping Entries	1024	0
Input Security Associations	512	3
Output Security Associations and Policies	512	0
SGT_DGT	8192/512	0/0
CLIENT_LE	4096/256	2/0
INPUT_GROUP_LE	1024	0
OUTPUT_GROUP_LE	1024	0
Macsec SPD	256	0
CAM Utilization for ASIC Instance [4]		
--snip--		
CAM Utilization for ASIC Instance [5]		
--snip--		

## Succesvolle hardwareprogrammering

Alle functies (of het nu een mac-adres, een interface, een vlan, enzovoort is) worden opgeslagen in de objectdatabase en geprogrammeerd in de hardware als objecten.

De adviesgroep programmeert het KP, de FED en de FED en programmeert vervolgens de Supervisor die de ASIC-hardware doorstuurt. RP-softwaregegevens worden opgeslagen als objecten in de objectdatabase en de FP-softwaregegevens worden opgeslagen als asynchrone objecten in de objectdatabase.

Wanneer de FED de FED programmeert (die op zijn beurt de Supervisor Forwarding ASIC programmeert), stuurt de FED een ontvangstbevestiging naar de FFP. Het KP stuurt het vervolgens door naar de RP om aan te geven dat de hardwareprogrammering met succes is afgerond. Als FED hardware programmeren ontbreekt of onjuist is, kunt u deze opdracht gebruiken om problemen en/of bevestigingen op te sporen.

<#root>

C9400#

```
show platform software object-manager fp active statistics
```

#### Forwarding Manager Asynchronous Object Manager Statistics

```
Object update: Pending-issue: 0, Pending-acknowledgement: 0
Batch begin:   Pending-issue: 0, Pending-acknowledgement: 0
Batch end:     Pending-issue: 0, Pending-acknowledgement: 0
Command:      Pending-acknowledgement: 0
Total-objects: 3269
Stale-objects: 0
Resolve-objects: 0
Error-objects: 0
Paused-types: 0
```

Als de vorige opdracht niet-nul objecten in wachtende uitgiftestaat toont, gebruik deze opdracht om het objectnummer in kwestie te vinden:

```
<#root>
```

```
C9400#
```

```
show platform software object-manager fp active pending-issue-update
```

Gebruik vervolgens deze opdracht om het proces vast te leggen dat gekoppeld is aan het objectnummer:

```
<#root>
```

```
C9400#
```

```
show platform software object-manager fp active object {object#}
```

Aan de RP-kant, gebruik deze opdracht om te controleren op verwijdering hangende (Del Pend) voor een object dat de FP niet erkende.

```
<#root>
```

```
C9400#
```

```
show platform software object-manager rp active object-type-info
```

Object type	Name	Count	Del Pend	Layer
CC	cc	5	0	2
SPA	spa	0	0	4
PORT_DPIDB	port_dpidx	164	0	10
CHANNEL_DPIDB	channel_dpidx	0	0	12
VIRTUAL_DPIDB	virtual_dpidx	503	0	13
SW_DPIDB	sw_dpidx	0	0	17



```

conformed 0 bytes; actions:
  transmit
exceeded 0 bytes; actions:
  drop

```

```

Class-map: class-default (match-any)
  0 packets, 0 bytes
  5 minute offered rate 0000 bps, drop rate 0000 bps
Match: any

```

De zelfde output van CoPP zoals het vorige voorbeeld wordt hier getoond in korreliger en eenvoudiger te lezen (samengeperst) formaat.

```
<#root>
```

```
C9400#
```

```
show platform hardware fed active qos queue stats internal cpu policer
```

#### CPU Queue Statistics

```

=====

```

QId	PlcIdx	Queue Name	Enabled	(default) Rate	(set) Rate	Queue Drop(Bytes)	Queue Drop(Frames)
0	11	DOT1X Auth	Yes	1000	1000	0	0
1	1	L2 Control	Yes	2000	400	0	0
2	14	Forus traffic	Yes	1000	1000	0	0
3	0	ICMP GEN	Yes	600	600	0	0
4	2	Routing Control	Yes	5400	1800	0	0
5	14	Forus Address resolution	Yes	1000	1000	0	0
6	0	ICMP Redirect	Yes	600	600	0	0
7	16	Unused	Yes	1000	1000	0	0
8	4	L2 LVX Cont Pack	Yes	1000	1000	0	0
9	16	EWLC Control	Yes	1000	1000	0	0
10	16	EWLC Data	Yes	1000	1000	0	0
11	13	L2 LVX Data Pack	Yes	1000	1000	0	0
12	0	BROADCAST	Yes	600	600	0	0
13	10	Learning cache ovfl	Yes	100	200	0	0
14	13	Sw forwarding	Yes	1000	1000	0	0
15	8	Topology Control	Yes	13000	13000	0	0
16	12	Proto Snooping	Yes	2000	2000	0	0
17	16	DHCP Snooping	Yes	1000	1000	0	0
18	9	Transit Traffic	Yes	500	400	0	0
19	10	RPF Failed	Yes	100	200	0	0
20	15	MCAST END STATION	Yes	2000	2000	0	0
21	13	LOGGING	Yes	1000	1000	0	0
22	7	Punt Webauth	Yes	1000	1000	0	0
23	10	Crypto Control	Yes	100	200	0	0
24	10	Exception	Yes	100	200	0	0
25	3	General Punt	Yes	200	200	0	0
26	10	NFL SAMPLED DATA	Yes	100	200	0	0
27	2	Low Latency	Yes	5400	1800	0	0
28	10	EGR Exception	Yes	100	200	0	0
29	5	Stackwise Virtual Control	No	8000	8000	0	0
30	9	MCAST Data	Yes	500	400	0	0

31 10 Gold Pkt Yes 100 200 0 0

\* NOTE: CPU queue policer rates are configured to the closest hardware supported value

CPU Queue Policer Statistics

```

=====
Policer      Policer Accept  Policer Accept  Policer Drop  Policer Drop
  Index      Bytes          Frames          Bytes          Frames
-----
0            3132           36              0              0
1          239197001  721952          0              0
2          123004776   978818          0              0
3            0            0              0              0
4            0            0              0              0
5            0            0              0              0
6            0            0              0              0
7            0            0              0              0
8           1024           16              0              0
9            0            0              0              0
10          13600           200             0              0
11           0            0              0              0
12           0            0              0              0
13          1298            3              0              0
14          80520           9158            0              0
15          2189268       23733            0              0
16           0            0              0              0
17           0            0              0              0

```

CPP Classes to queue map

```

=====
PlcIdx CPP Class                               : Queues
-----
0      system-cpp-police-data                  : ICMP GEN/BROADCAST/ICMP Redirect/
10     system-cpp-police-sys-data              : Learning cache ovfl/Crypto Control/Exception/EGR Exc
13     system-cpp-police-sw-forward            : Sw forwarding/LOGGING/L2 LVX Data Pack/
9      system-cpp-police-multicast             : Transit Traffic/MCAST Data/
15     system-cpp-police-multicast-end-station : MCAST END STATION /
7      system-cpp-police-punt-webauth          : Punt Webauth/
1      system-cpp-police-l2-control            : L2 Control/
5      system-cpp-police-stackwise-virt-control : Stackwise Virtual Control/
2      system-cpp-police-routing-control       : Routing Control/Low Latency/
3      system-cpp-police-control-low-priority  : General Punt/
4      system-cpp-police-l2lvx-control        : L2 LVX Cont Pack/
8      system-cpp-police-topology-control      : Topology Control/
11     system-cpp-police-dot1x-auth           : DOT1X Auth/
12     system-cpp-police-protocol-snooping    : Proto Snooping/
14     system-cpp-police-forus                : Forus Address resolution/Forus traffic/
5      system-cpp-police-stackwise-virt-control : Stackwise Virtual Control/
16     system-cpp-default                     : DHCP Snooping/Unused/EWLC Control/EWLC Data/

```

Controleer het CPU puntpad (hardware-UADP 2.0 richting software-CPU) vanuit het perspectief van de software (CPU).

<#root>

C9400#

```
show platform software infrastructure lsmpi
```

```
LSMPI interface internal stats:
```

```
enabled=0, disabled=0, throttled=0, unthrottled=0, state is ready
```

```
Input Buffers = 8801257
```

```
Output Buffers = 5506129
```

```
rxdone count = 8801257
```

```
txdone count = 5506128
```

```
Rx no particletype count = 0
```

```
Tx no particletype count = 0
```

```
Txbuf from shadow count = 0
```

```
No start of packet = 0
```

```
No end of packet = 0
```

```
Punt drop stats:
```

```
Bad version 0
```

```
Bad type 0
```

```
Had feature header 0
```

```
Had platform header 0
```

```
Feature header missing 0
```

```
Common header mismatch 0
```

```
Bad total length 0
```

```
Bad packet length 0
```

```
Bad network offset 0
```

```
Not punt header 0
```

```
Unknown link type 0
```

```
No swidb 0
```

```
Bad ESS feature header 0
```

```
No ESS feature 0
```

```
No SSLVPN feature 0
```

```
No PPP bridge feature 0
```

```
Punt For PPP bridge type packets 0
```

```
Punt For Us type unknown 0
```

```
EPC CP RX Pkt cleansed 0
```

```
Punt cause out of range 0
```

```
IOSXE-RP Punt packet causes:
```

```
    42879 Layer2 control and legacy packets
```

```
    3644168 ARP request or response packets
```

```
    7584 For-us data packets
```

```
    1794 Mcast Directly Connected Source packets
```

```
    1573 Mcast PIM signaling packets
```

```
    750076 For-us control packets
```

```
38058 Layer2 bridge domain data packet packets
```

```
    3823736 Layer2 control protocols packets
```

```
FOR_US Control IPv4 protocol stats:
```

```
    750076 [proto=0] packets
```

```
Packet histogram(500 bytes/bin), avg size in 125, out 126:
```

Pak-Size	In-Count	Out-Count
0+	8228322	5207592
500+	41355	1717
1000+	4331	2402
1500+	35860	20017

```
Lsmpi11/3 is up, line protocol is up
```

```
<-- CPU interface
```

```
Hardware is LSMPI
```

```
MTU 1500 bytes, BW 1000000 Kbit/sec, DLY 10 usec,
```

```
reliability 255/255, txload 1/255, rxload 1/255
```

```

Encapsulation ARPA, loopback not set
Keepalive not set
Unknown, Unknown, media type is unknown media type
output flow-control is unsupported, input flow-control is unsupported
ARP type: ARPA, ARP Timeout 04:00:00
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/1500/0/0 (size/max/drops/flushes); Total output drops: 0
Queueing strategy: fifo
Output queue: 0/40 (size/max)
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
 8309868 packets input, 0 bytes, 0 no buffer
  Received 0 broadcasts (0 IP multicasts)
  0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast, 0 pause input
 5231728 packets output, 659535525 bytes, 0 underruns
  0 output errors, 0 collisions, 0 interface resets
  0 unknown protocol drops
  0 output buffer failures, 0 output buffers swapped out

```

<#root>

C9400#

show platform software infrastructure lsmpi punt

LSMPI punt statistics

```

Total packets consumed:          876
Total packets forwarded:         8468766
First frag packets:              0
Total packets consumed & forwarded: 0

```

Cause	Total consumed	Total forwarded	Length error	Dot1q encap exceeded	Other linktype
MPLS ICMP Can't Fragment	0	0	0	0	0
IPv4 Options	0	0	0	0	0
Layer2 control and legacy	0	0	0	0	0
PPP Control	0	0	0	0	0
CLNS IS-IS Control	0	0	0	0	0
HDLC keepalives	0	0	0	0	0

--snip--

Controleer de CPU-injectiepad (software-CPU naar hardware-Supervisor) statistieken vanuit het perspectief van de software (CPU).

<#root>

C9400#

show platform software infrastructure inject



```

Statistics for L3 injected packets:
5233473 total inject pak, 3 failed
0 sent, 859329 prerouted
0 non-CEF capable, 855296 non-unicast
859826 IP, 0 IPv6
0 MPLS, 0 Non-IP Tunnel
0 UDLR tunnel, 0 P2MP replicated mcast
0 Non-IP Fastswitched over Tunnel, 4373497 legacy pak path
0 Other packet
0 IP fragmented
644 normal, 391 nexthop
858788 adjacency, 150 feature
0 undefined
3 pak find no adj, 0 no adj-id
137322 sb alloc, 856085 sb local
0 p2mcast failed count 0 p2mcast enqueue fail
0 unicast dhc
0 mobile ip
0 IPv6 NA
0 IPv6 NS
0 Transport failed cases
0 Grow packet buffer
per feature packet inject statistics
150 Feature multicast
0 Feature Edge Switching Service
0 Feature Session Border Controller
0 Feature interrupt level
0 Feature use outbound interface
0 Feature interrupt level with OCE
0 Feature ICMPv6 error message
0 Feature Session Border Controller media packet injection
0 Feature Tunnel Ethernet over GRE
0 Feature Secure Socket Layer Virtual Private Network
0 Feature EPC Wireshark injecting packets

```

```

Statistics for L2 injected packets:
0 total L2 inject pak, 0 failed
0 total BD inject pak, 0 failed
0 total EFP inject pak, 0 failed
0 total VLAN inject pak, 0 failed

```

Controleer de CPU punt-/injectiepadraatstatistieken vanuit het perspectief van de FED (UADP 2.0).

```
<#root>
```

```
C9400#
```

```
show platform software fed active lsmpi stat
```

```
LSMPI Statistics
```

```

-----
Transmit: -----> FED transmit = FED (Supervisor) punt to CPU
  Packet Count      : 8469445
  Bytes Count       : 1055390613
  particle Count    : 8951009
  particle with App : 7258

```

```
Ring Full Error      : 0
No Buff Error       : 0
TX Ring Free        : 2047
TX Ring Busy        : 0
TX Ring Size        : 2048
TXDone Ring Free    : 6816
TXDone Ring Busy    : 9567
TXDone Ring Size    : 16384
```

Receive: -----> FED receive = CPU inject to FED (Supervisor)

```
Packet Count        : 5450099
Bytes Count         : 675084903
Particle Count      : 5695697
Particles with App  : 4294966854
RX Done Count       : 5696139
No SOP              : 0
No EOP              : 0
Not Enough Buf      : 0
Max Not Enough Buf  : 0
RX Ring Free        : 4095
RX Ring Busy        : 0
RX Ring Size        : 4096
RXDone Ring Free    : 8191
RXDone Ring Busy    : 0
RXDone Ring Size    : 8192
```

-----

Controleer het CPU puntpad (hardware-Supervisor naar software-CPU) statistieken vanuit het perspectief van de FED (Supervisor).

<#root>

C9400#

`show platform software fed active punt cause summary`

Statistics for all causes

Cause	Cause Info	Rcvd	Dropped
7	ARP request or response	3644168	0
11	For-us data	1524	0
12	Mcast Directly Connected Source	1794	0
25	Mcast PIM signaling	1573	0
55	For-us control	750461	0
58	Layer2 bridge domain data packet	38058	0
96	Layer2 control protocols	3825228	0

-----

Controleer de status van de 31 individuele CPU puntwachtrijen vanuit het perspectief van de FED (Supervisor).

<#root>

C9400#

show platform software fed active cpu-interface

queue	retrieved	dropped	invalid	hol-block
Routing Protocol	790844	0	0	0
L2 Protocol	2774488	0	0	0
sw forwarding	0	0	0	0
broadcast	0	0	0	0
icmp	0	0	0	0
icmp redirect	0	0	0	0
Logging	0	0	0	0
rpf-fail	1573	0	0	0
DOT1X authentication	0	0	0	0
Forus Traffic	1524	0	0	0
Forus Resolution	3644192	0	0	0
Wireless q5	0	0	0	0
Wireless q1	0	0	0	0
Wireless q2	0	0	0	0
Wireless q3	0	0	0	0
Wireless q4	0	0	0	0
Learning cache	0	0	0	0
Topology control	1198807	0	0	0
Proto snooping	0	0	0	0
BFD Low latency	0	0	0	0
Transit Traffic	0	0	0	0
Multi End station	38058	0	0	0
Health Check	0	0	0	0
Health Check	0	0	0	0
Crypto control	0	0	0	0
Exception	0	0	0	0
General Punt	0	0	0	0
NFL sampled data	0	0	0	0
STG cache	0	0	0	0
EGR exception	0	0	0	0
FSS	0	0	0	0
Multicast data	1794	0	0	0

<#root>

C9400#

show platform software fed active punt cpuq all

Punt CPU Q Statistics

=====

-snip-

CPU Q Id : 1  
CPU Q Name : CPU\_Q\_L2\_CONTROL

Packets received from ASIC : 2669864 -----> Packets received by the FED process from the Super  
Send to IOSd total attempts : 2669864 -----> Packets sent from the FED process to IOSd

Send to IOSd failed count : 0

```

RX suspend count           : 0
RX unsuspend count        : 0
RX unsuspend send count   : 0
RX unsuspend send failed count : 0
RX consumed count         : 0
RX dropped count          : 0
RX non-active dropped count : 0
RX conversion failure dropped : 0
RX INTACK count           : 2243784
RX packets dq'd after intack : 5074
Active RxQ event          : 2243785
RX spurious interrupt     : 322266

CPU Q Id                   : 2
CPU Q Name                  : CPU_Q_FORUS_TRAFFIC
Packets received from ASIC : 1524
Send to IOSd total attempts : 1524
Send to IOSd failed count  : 0
RX suspend count           : 0
RX unsuspend count        : 0
RX unsuspend send count   : 0
RX unsuspend send failed count : 0
RX consumed count         : 0
RX dropped count          : 0
RX non-active dropped count : 0
RX conversion failure dropped : 0
RX INTACK count           : 1347
RX packets dq'd after intack : 8
Active RxQ event          : 1347
RX spurious interrupt     : 38

```

-snip-

Controleer de CPU-injectiepad (software-CPU naar hardware-Supervisor) statistieken vanuit het perspectief van de FED (Supervisor).

<#root>

C9400#

`show platform software fed active inject cause summary`

Statistics for all causes

Cause	Cause Info	Rcvd	Dropped
1	L2 control/legacy	4331682	0
2	QFP destination lookup	290	0
3	QFP IPv4/v6 nexthop lookup	391	0
7	QFP adjacency-id lookup	859393	265
8	Mcast specific inject packet	150	0
12	ARP request or response	601	0

Controleer de status van de 2 afzonderlijke CPU-injectierijen vanuit het perspectief van de FED

(UADP 2.0).

<#root>

C9400#

show platform software fed active inject cpuq all

#### Inject CPU Q Statistics

=====

```
CPU Q Id          : 0
CPU Q Name        : TX_CPUQ_PRIO_LOW ---> low priority CPU inject queue

Packets received from IOSd      : 168342
Enq to pkt driver total attempts : 168277
Enq to pkt driver failed count   : 0
Count of TX CMPL received       : 168277
TX suspend count                 : 0
TX unsuspend count               : 0
TX dropped count                 : 265
TX punted count                  : 0
TX App enq failed                : 0
```

```
CPU Q Id          : 7
CPU Q Name        : TX_CPUQ_PRIO_HI ---> high priority CPU inject queue

Packets received from IOSd      : 5024664
Enq to pkt driver total attempts : 5024664
Enq to pkt driver failed count   : 0
Count of TX CMPL received       : 5024664
TX suspend count                 : 0
TX unsuspend count               : 0
TX dropped count                 : 0
TX punted count                  : 0
TX App enq failed                : 0
```

Stats for all txq:

```
-----
TX chunk malloc fail count      : 0
-----
```

## Statistieken voor MAC-tabelgebeurtenissen

<#root>

C9400#

show platform software fed active matm stats

MATM counters

```

Total non-cpu mac entries      : 10
Mac Learn SPI Msg Count       : 0
Mac Learn SPI Err Count       : 0
Mac Delete SPI Msg Count      : 0
Mac Delete SPI Err Count      : 0
Mac Learn Count                : 967
Mac Add Count                  : 989
Mac AL add Count               : 971
Mac Del Count                  : 957
Mac AL Del Count               : 961

Mac Move Count                 : 2 ----> MAC moves between interfaces (see details above)

Mac AL Move Count              : 0
Mac Clear Count                : 0
Mac Del all count              : 6
Mac table create Count         : 9
Mac VP event Count             : 5
Mac Update info Count          : 0
Mac Vlan age config Event Count : 0
Mac Vlan Link Event Count      : 6
Mac SVI linkEvent Count        : 3
Mac Bsync Event Count          : 0
Mac Isync Event Count          : 0
Mac Recon Start Count          : 0
Mac Recon Event Count          : 0
Mac IFM event Count            : 75
Mac FEC Event Count            : 0
Mac Aging Tick Count           : 0
Mac Retry event Count          : 0
Mac Hw Update Err Count        : 0
Mac In retryQ Count            : 0

```

<#root>

C9400#

configure terminal

C9400(config)#

mac address-table notification ?

```

change      Enable/Disable MAC Notification feature on the switch
mac-move    Enable Mac Move Notification
threshold   Configure L2 Table monitoring

```

C9400(config)#C9400(config)#

mac address-table notification mac-move ----> enabled by default, syslog generated for any MAC move (show

C9400(config)#

mac address-table notification change ?

```

history-size  Number of MAC notifications to be stored
interval      Interval between the MAC notifications
<cr>         <cr>

```

C9400(config)#

mac address-table notification change ----> disabled by default

<#root>

C9400#

show mac address-table notification mac-move

MAC Move Notification:

enabled

<#root>

C9400#

show mac address-table notification change

MAC Notification Feature is Enabled on the switch  
Interval between Notification Traps : 1 secs  
Number of MAC Addresses Added : 0  
Number of MAC Addresses Removed : 0  
Number of Notifications sent to NMS : 0  
Maximum Number of entries configured in History Table : 1  
Current History Table Length : 0  
MAC Notification Traps are Disabled  
History Table contents  
-----

## UADP 2.0 uitzonderingsdruppels

Deze opdracht geeft alle redenen op waarom een UADP 2.0-doorsturen ASIC een pakket laat vallen:

<#root>

C9400#

show platform hardware fed active fwd-asic drops exceptions

\*\*\*\*EXCEPTION STATS ASIC INSTANCE 0 (asic/core 0/0)\*\*\*\*

Asic/core	NAME	prev	current	delta
0 0	NO_EXCEPTION	0	0	0
0 0	IPV4_CHECKSUM_ERROR	0	0	0
0 0	ROUTED_AND_IP_OPTIONS_EXCEPTION	0	0	0

0	0	CTS_FILTERED_EXCEPTION	0	0	0
0	0	SIA_TTL_ZERO	0	0	0
0	0	ALLOW_NATIVE_EXCEPTION_COUNT	0	0	0
0	0	ALLOW_DOT1Q_EXCEPTION_COUNT	0	0	0
0	0	ALLOW_PRIORITY_TAGGED_EXCEPTION_COUNT	0	0	0
0	0	ALLOW_UNKNOWN_ETHER_TYPE_EXCEPTION	0	0	0
0	0	IP_SOURCE_GUARD_VIOLATION	0	0	0
0	0	SECURE_L3IF_LEARNING_VIOLATION	0	0	0
0	0	AUTH_DRIVEN_DROP	0	0	0
0	0	VLAN_LOADBALANCE_GROUP_DENY	0	0	0
0	0	RPF_UNICAST_FAIL	0	0	0
0	0	RPF_UNICAST_FAIL_SUPPRESS	0	0	0
0	0	RPF_UNICAST_CHECK_INCOMPLETE	0	0	0
0	0	RPF_MULTICAST_FAIL	0	0	0
0	0	PKT_DROP_COUNT	0	0	0
0	0	SOURCE_ROUTE_EXCEPTION	0	0	0
0	0	IGR_MISC_FATAL_ERROR	0	0	0
0	0	BLOCK_FORWARD	0	0	0
0	0	POLICER_DROP	0	0	0
0	0	DENY_ROUTE	0	0	0
0	0	DENY_BRIDGE	0	0	0
0	0	STATIC_MAC_VIOLATION	0	0	0
0	0	STATIC_IP_VIOLATION	0	0	0
0	0	FPM_DROP_PACKET	0	0	0
0	0	IGR_EXCEPTION_L4_ERROR	0	0	0
0	0	IGR_EXCEPTION_L5_ERROR	0	0	0
0	0	IGR_EXCEPTION_HARDWARE_PARSE_EXCEPTION	0	0	0
0	0	IGR_EXCEPTION_INVALID_VLAN_DROP	0	0	0
0	0	IGR_EXCEPTION_31	0	0	0
0	0	FRAGMENTING_IPV4_WITH_OPTIONS	0	0	0
0	0	FRAGMENTING_IPV6_WITH_EXTENSIONS	0	0	0
0	0	ICMP_REDIRECT	0	0	0
0	0	MTU_FAIL_PUNT_TO_CPU_NO_IP_UNREACHABLE	0	0	0
0	0	LINK_LOCAL_CHECK_FAIL_NO_IP_UNREACHABLE	0	0	0
0	0	IP_UNICAST_TTL_REACHED_ZERO	0	0	0
0	0	MISC_FATAL_ERROR	0	0	0
0	0	STP_OR_FLEXLINK_DROP	0	0	0
0	0	PROTECTED_PORT_DROP	0	0	0
0	0	PVLAN_ISOLATED_CHECK_FAILED	0	0	0
0	0	PVLAN_COMMUNITY_CHECK_FAILED	0	0	0
0	0	DEJA_VU_CHECK_FAILED	0	0	0
0	0	NOT_VLAN_LOAD_BALANCE_GROUP_ALLOWED	0	0	0
0	0	RSPAN_DROP	0	0	0
0	0	SPLIT_HORIZON_DROP	0	0	0
0	0	SYSTEM_TTL_DROP	0	0	0
0	0	PRUNED	0	0	0
0	0	DENY_NO_IP_UNREACHABLE	0	0	0
0	0	IP_MULTICAST_TTL_REACHED_ZERO	0	0	0
0	0	MTU_FAIL_DROP_BRIDGED	0	0	0
0	0	MTU_FAIL_DROP_BRIDGED_IP_ROUTED	0	0	0
0	0	MTU_FAIL_ERSPAN	0	0	0
0	0	LINK_LOCAL_CHECK_FAIL_L3M_VALID	0	0	0
0	0	DENY_NOT_NO_IP_UNREACHABLE	0	0	0
0	0	MTU_FAIL_PUNT_TO_CPU_NOT_NO_IP_UNREACHABLE	0	0	0
0	0	LINK_LOCAL_CHECK_FAIL_NOT_NO_IP_UNREACHABLE	0	0	0
0	0	COPY_TO_CPU	0	0	0
0	0	EGR_L3_ERROR	0	0	0
0	0	EGR_L4_ERROR	0	0	0
0	0	EGR_L5_ERROR	0	0	0
0	0	EGR_HARDWARE_PARSE_EXCEPTION	0	0	0
0	0	EGR_SHOW_FORWARD_DROP	0	0	0



\*\*\*\*EXCEPTION STATS ASIC INSTANCE 1 (asic/core 0/1)\*\*\*\*

Asic/core	NAME	prev	current	delta
0 1	NO_EXCEPTION	13168	16679	3511
0 1	IPV4_CHECKSUM_ERROR	0	0	0
0 1	ROUTED_AND_IP_OPTIONS_EXCEPTION	81	103	22

--snip--

## Supervisor Statistieken - Supervisor naar lijnkaartgegevenspad

Controleer de actieve Supervisor UADP 2.0 doorsturen van ASIC-statistieken die zijn gekoppeld aan een specifieke voorpaneelinterface. In dit voorbeeld wordt de interface Gig1/0/13 gebruikt.

Voorbeeld uitvoer:

- Controleer welke interfaces op de lijnkaart deel uitmaken van dezelfde poortgroep.
- Elke poortgroep deelde 8 Gbps bandbreedte van de Line Card Stub ASIC naar de Supervisor Forwarding ASIC.
- Elke poortgroep is gekoppeld aan een van de SLI (System Link Interface) op de Line Card Stub ASIC naar de Supervisor Forwarding ASIC.

<#root>

C9400#

```
show platform hardware cman fp active data-path 1 13 detail ---> Slot 1, interface 13
```

```
showing cman data-path for frontpanel 1/0/13
```

```
fp_portmap.xml: ---> Supervisor ASIC 1, core 0 is associated with front panel (fp) interface Gig1/0/13
```

```
id 13 asic 1 core 0 port 12 mac 0 subport 4 contextid 0 maxspeed DEV_PORT_SPEED_1G gpn 113 active 1
```

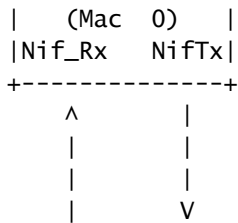
```
data path:
```

```
slot 3
```

```
+-- ACTIVE_SUP ---+
|   Sif 0   |
| IQS     SQS |
```

```
---> Supervisor ASIC 1, core 0 on the slot 3 active Supervisor associated with interface Gig1/0/13
```

```
|   PBC   |
|   AQM   |
|   EQC   |
|   ESM   |
|   RWE   |
| ASIC 1  |
| Core 0  |
| Asic Port 12 |
|         |
```



=====

Nif MAC 0 Inforation:

NifRxByteGroupStats:

rxBytes 4495494

NifRxByteDestinationGroupStats:

rxUnicastBytes 1174628

rxMulticastBytes 3320866

rxBroadcastBytes 0

NifRxPortStatusGroupStats:

rxUnicastFrames 18326

rxMulticastFrames 21387

rxBroadcastFrames 0

rxPauseFrames 0

rxCos0PauseFrames 0

rxCos1PauseFrames 0

rxCos2PauseFrames 0

rxCos3PauseFrames 0

rxCos4PauseFrames 0

rxCos5PauseFrames 0

rxCos6PauseFrames 0

rxCos7PauseFrames 0

rxOamProcessedFrames 0

NifRxPortStatusGroupStats:

rxCollisionFragments 0

rxFcsErrorFrames 0

rxInvalidOversizeFrames 0

rxMacOverrunFrames 0

rxIpgViolationFrames 0

rxOamDroppedFrames 0

rxSymbolErrorFrames 0

rxValidOversizeFrames 0

rxValidUndersizeFrames 0

NifRxSizeGroupStats:

rx32768toMtuFrames 0

rx16384to32767ByteFrames 0

rx8192to16383ByteFrames 0

rx4096to8191ByteFrames 0

rx2048to4095ByteFrames 0

rx1519to2047ByteFrames 51

rx1024to1518ByteFrames 15

rx512to1023ByteFrames 17

rx256to511ByteFrames 3406

rx128to255ByteFrames 6567

rx65to127ByteFrames 11295

rx64ByteFrames 18362

=====

NifTxByteGroupStats:

txBytes 6499427

NifTxByteDestinationGroupStats:

txUnicastBytes 1175536

txMulticastBytes 5298482

txBroadcastBytes 25409

NifTxFrameDestinationGroupStats:

txUnicastFrames 18330

txMulticastFrames 24834

txBroadcastFrames 51

txPauseFrames 0

txCos0PauseFrames 0

txCos1PauseFrames 0

txCos2PauseFrames 0

txCos3PauseFrames 0

txCos4PauseFrames 0

txCos5PauseFrames 0

txCos6PauseFrames 0

txCos7PauseFrames 0

txOamFrames 0

NifTxPortStatusGroupStats:

txLateCollisionFrames 0

txsystemFcsErrorFrames 0

txOversizeFrames 0

txMacUnderrunFrames 0

txDeferredFrames 0

txExcessiveDeferralFrames 0

txOkMultipleCollisionFrames 0

txOkSingleCollisionFrames 0

goldFramesTruncated 0

NifTxSizeGroupStats:

tx32768toMtuFrames 0

tx16384to32767ByteFrames 0

tx8192to16383ByteFrames 0

tx4096to8191ByteFrames 0

tx2048to4095ByteFrames 0

tx1519to2047ByteFrames 0

tx1024to1518ByteFrames 0

tx512to1023ByteFrames 187

tx256to511ByteFrames 9407

tx128to255ByteFrames 6580

tx65to127ByteFrames 8583

tx64ByteFrames 18458

-----> Input queue (Igr = Ingress)

IgrPacketCounters:

packetsIn 97777

packetsOut 97777

packetsDropped 3383

fpsSourcedPadErrorCount 0

igrSourcedPadErrorCount 0

EgrPacketCounters:

packetsIn 580324

packetsEnqueueFcd\_val 0

packetsMarkedForDrop 278

padErrorPacketsIn 0

padErrorPacketsOut 0

=====

For RWE for core 0:

RweTotalEnqStats:	
packetCount	580324
RweTotalDeqStats:	
packetCount	580046
FragmentCount	580046

=====

For EQC for core 0:

EqcTotalEnqStats:	
Count	580704
EqcTotalDeqStats:	
Count	580324

=====

For aqmRedQueueStats for asic port 12:

AqmRedQueueStats: (sum of all queues) ---> Output queue (Aqm = Active queue management)

acceptByteCnt0	0
acceptFrameCnt0	0
acceptByteCnt1	6407742
acceptFrameCnt1	43070
acceptByteCnt2	39609
acceptFrameCnt2	395
dropByteCnt0	0
dropFrameCnt0	0
dropByteCnt1	0
dropFrameCnt1	0
dropByteCnt2	0
dropFrameCnt2	0
outOfSoftBufDropByteCnt	0
outOfSoftBufDropFrameCnt	0
maxQebDropByteCnt	0
maxQebDropFrameCnt	0

=====

For PBC for core 0:

PbcIngressErrorDropCount:		PbcEgressErrorDropCount:	
iCount	0	eS0Count	0
iCount	0	eS1Count	0
PbcCreditCount:		PbcEnqFcErrorDropCount:	
creditCount	64	fCount	0
rwePbcStall	0		

=====

For local/core 0 Switching:

SqsCumulativeStatistics	
totalEnqStat	1368200
totalDeqStat	1368200
totalDropStat	0
SqsCumulativeStatisticsB	
totalEnqStat	173449513
totalDeqStat	173449513
totalDropStat	0

=====

For local/core 1 Switching:

SqsCumulativeStatistics	
totalEnqStat	890114
totalDeqStat	890114
totalDropStat	0
SqsCumulativeStatisticsB	
totalEnqStat	105061923
totalDeqStat	105061923
totalDropStat	0

=====

For Sif 0 Switching:

		SifSifPbcCnt0:	
		Count	81302675
		SifSifPbcCnt1:	
		Count	58187651
SifRacInsertedCnt:		SifRacCopiedCnt:	
SifRacInsertedCnt[0]	2295051	SifRacCopiedCnt[0]	35850468
SifRacInsertedCnt[1]	1738892	SifRacCopiedCnt[1]	19265491
SifRacInsertedCnt[2]	1666479	SifRacCopiedCnt[2]	23814855
SifRacInsertedCnt[3]	2773364	SifRacCopiedCnt[3]	32727259
SifRacInsertedCnt[4]	3126116	SifRacCopiedCnt[4]	38376676
SifRacInsertedCnt[5]	2066567	SifRacCopiedCnt[5]	22176467

=====

For Sif 1 Switching:

		SifSifPbcCnt0:	
		Count	40956521
		SifSifPbcCnt1:	
		Count	40956521
SifRacInsertedCnt:		SifRacCopiedCnt:	
SifRacInsertedCnt[0]	11713808	SifRacCopiedCnt[0]	8615615
SifRacInsertedCnt[1]	8319576	SifRacCopiedCnt[1]	7489596
SifRacInsertedCnt[2]	8816344	SifRacCopiedCnt[2]	7608895
SifRacInsertedCnt[3]	15404080	SifRacCopiedCnt[3]	8717898
SifRacInsertedCnt[4]	16161715	SifRacCopiedCnt[4]	9685735
SifRacInsertedCnt[5]	9745420	SifRacCopiedCnt[5]	7866174

Controleer de status van de stroomregeling vanuit een Supervisor-perspectief op de interface van het voorpaneel. Dit helpt bij het identificeren van eventuele congestie op de interface.

<#root>

C9400#

show platform hardware cman fp active flowcontrol status

```

slot 1:Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
      EsmF - - - - - - - - - - - - - - - - - - - - - - - - - -
      IqsC - - - - - - - - - - - - - - - - - - - - - - - - - -
Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
      EsmF - - - - - - - - - - - - - - - - - - - - - - - - - -
      IqsC - - - - - - - - - - - - - - - - - - - - - - - - - -

slot 2:  Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
      EsmF - - - - - - - - - - - - - - - - - - - - - - - - - -
      IqsC - - - - - - - - - - - - - - - - - - - - - - - - - -
Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
      EsmF - - - - - - - - - - - - - - - - - - - - - - - - - -
      IqsC - - - - - - - - - - - - - - - - - - - - - - - - - -

slot 3:  Port 01 02 03 04 05 06 07 08 09 10
      EsmF - - - - - - - - - -
      IqsC 01 - - - - - - - -

slot 4:  Port 01 02 03 04 05 06 07 08 09 10
      EsmF - - - - - - - - - -
      IqsC - - - - - - - - - -

```

```

slot 5:  Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
        EsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
        IqsC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  - 01 -  -
        Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
        EsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
        IqsC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
slot 6:  Possibly linecard is not inserted
slot 7:  Possibly linecard is not inserted

```

Controleer of het controleverkeer stroomt vanuit een Supervisor die ASIC-perspectief doorstuurt tussen de Supervisor die ASIC doorstuurt op de actieve Supervisor en de Line card stub ASIC op de Line card via de OCI-interfaces.

<#root>

C9400#

```
show platform hardware cman fp active oci status
```

processing oci information:

```

chassis_type:      1
sup slot:          4
sup num oci ports: 8

```

```

slot_id 1 : oci_enable Enabled   Link Status 0 (UP)
             ASIC_id 1 core_id 0 oci_port 3 mac_id 0
             NruRxByteGroupStats: rxBytes 417829462717812           NruTxByteGroupStats: txBytes 58891128
slot_id 2 : oci_enable Enabled   Link Status 0 (UP)
             ASIC_id 0 core_id 0 oci_port 1 mac_id 1
             NruRxByteGroupStats: rxBytes 417938235716344           NruTxByteGroupStats: txBytes 58891760
slot_id 5 : oci_enable Enabled   Link Status 0 (UP)
             ASIC_id 1 core_id 0 oci_port 4 mac_id 1
             NruRxByteGroupStats: rxBytes 53195855717244           NruTxByteGroupStats: txBytes 58891542
slot_id 6 : oci_enable Enabled   Link Status 1 (DOWN)
             ASIC_id 2 core_id 0 oci_port 6 mac_id 0
             NruRxByteGroupStats: rxBytes 0                         NruTxByteGroupStats: txBytes 0
slot_id 7 : oci_enable Enabled   Link Status 1 (DOWN)
             ASIC_id 0 core_id 0 oci_port 2 mac_id 2
             NruRxByteGroupStats: rxBytes 0                         NruTxByteGroupStats: txBytes 0

```

## Statistieken lijnkaart - Supervisor naar lijnkaartgegevenspad

Controleer de statistieken van de Lijnkaartstomp ASIC die met een specifieke voorpaneelinterface worden geassocieerd. In dit voorbeeld is de interface Gig1/0/13 de focus.



| NIF\_Rx NIF\_Tx|  
+-----+

Front Port 1/0/13

^ |  
| |  
| |  
| V

=====  
Nif MAC 23 Inforation:

NifRxByteGroupStats:

rxBytes 4457854

NifRxByteDestinationGroupStats:

rxUnicastBytes 1163684

rxMulticastBytes 3294170

rxBroadcastBytes 0

NifRxPortStatusGroupStats:

rxUnicastFrames 18155

rxMulticastFrames 21235

rxBroadcastFrames 0

rxPauseFrames 0

rxCos0PauseFrames 0

rxCos1PauseFrames 0

rxCos2PauseFrames 0

rxCos3PauseFrames 0

rxCos4PauseFrames 0

rxCos5PauseFrames 0

rxCos6PauseFrames 0

rxCos7PauseFrames 0

rxOamProcessedFrames 0

NifRxPortStatusGroupStats:

rxCollisionFragments 0

rxFcsErrorFrames 0

rxInvalidOversizeFrames 0

rxMacOverrunFrames 0

rxIpgViolationFrames 0

rxOamDroppedFrames 0

rxSymbolErrorFrames 0

rxValidOversizeFrames 0

rxValidUndersizeFrames 0

NifRxSizeGroupStats:

rx32768toMtuFrames 0

rx16384to32767ByteFrames 0

rx8192to16383ByteFrames 0

rx4096to8191ByteFrames 0

rx2048to4095ByteFrames 0

rx1519to2047ByteFrames 51

rx1024to1518ByteFrames 15

rx512to1023ByteFrames 17

rx256to511ByteFrames 3374

rx128to255ByteFrames 6505

rx65to127ByteFrames 11237

rx64ByteFrames 18191

NifTxByteGroupStats:

txBytes 6440428

NifTxByteDestinationGroupStats:

txUnicastBytes 1164528

txMulticastBytes 5250491

txBroadcastBytes 25409

NifTxFrameDestinationGroupStats:

txUnicastFrames 18158

txMulticastFrames 24625

txBroadcastFrames 51

txPauseFrames 0

txCos0PauseFrames 0

txCos1PauseFrames 0

txCos2PauseFrames 0

txCos3PauseFrames 0

txCos4PauseFrames 0

txCos5PauseFrames 0

txCos6PauseFrames 0

txCos7PauseFrames 0

txOamFrames 0

NifTxPortStatusGroupStats:

txLateCollisionFrames 0

txsystemFcsErrorFrames 0

txOversizeFrames 0

txMacUnderrunFrames 0

txDeferredFrames 0

txExcessiveDeferralFrames 0

txOkMultipleCollisionFrames 0

txOkSingleCollisionFrames 0

goldFramesTruncated 0

NifTxSizeGroupStats:

tx32768toMtuFrames 0

tx16384to32767ByteFrames 0

tx8192to16383ByteFrames 0

tx4096to8191ByteFrames 0

tx2048to4095ByteFrames 0

tx1519to2047ByteFrames 0

tx1024to1518ByteFrames 0

tx512to1023ByteFrames 186

tx256to511ByteFrames 9318

tx128to255ByteFrames 6518

tx65to127ByteFrames 8526

tx64ByteFrames 18286

-----> Input queue (Igr = Ingress)

IgrPacketCounters:

packetsIn 97078

EgrPacketCounters:

packetsIn 576307

```

packetsOut          97078          packetsEnqueueFcd_val  0
packetsDropped      0            packetsMarkedForDrop   0
fpsSourcedPadErrorCount  0        padErrorPacketsIn     0
igrSourcedPadErrorCount  0        padErrorPacketsOut    0

```

=====

For aqmRedQueueStats for asic port 12:

AqmRedQueueStats: (sum of all queues) ----> Output queue (Aqm = Active queue management)

```

acceptByteCnt0      0
acceptFrameCnt0     0
acceptByteCnt1      0
acceptFrameCnt1     0
acceptByteCnt2      6440428
acceptFrameCnt2     42834
dropByteCnt0        0
dropFrameCnt0       0
dropByteCnt1        0
dropFrameCnt1       0
dropByteCnt2        0
dropFrameCnt2       0
outOfSoftBufDropByteCnt  0
outOfSoftBufDropFrameCnt  0
maxQebDropByteCnt   0
maxQebDropFrameCnt  0

```

=====

SLI MAC 9 - SUP 0: ( an ACTIVE sup in slot 3 )

```

SLITxByteGroupStats:          txBytes          4457854
SLIRxByteGroupStats:          rxBytes          6440428

```

SLI MAC 1 - SUP 1:

```

SLITxByteGroupStats:          txBytes          0
SLIRxByteGroupStats:          rxBytes          0

```

Controleer de status van de stroomregeling vanuit het perspectief van de lijnkaart voor de interface van het voorpaneel. Dit helpt om eventuele congestie op de interface te identificeren.

- De waarden zijn "-" wanneer er geen debietcontrole anders is wordt het rijnummer dat debietcontrole (congestie) ervaart vermeld.
- De stroomcontrole die door de interface wordt ontvangen wordt overgegaan van de ASIC van de Lijnkaart op de Lijnkaart tot de ASIC van de Supervisor op de Supervisor waar AQM daalt typisch op de Supervisor ASIC van de Supervisor wordt gezien. De OCI (Out-of-band Control Interface) is het interne communicatiekanaal tussen de lijnkaart en de actieve supervisor die wordt gebruikt voor het signaleren van de stroomregeling van de lijnkaart naar de supervisor.

<#root>

C9400#

show platform hardware iomd 1/0 flowcontrol status ----> slot 1



Slot 1 - number of ports 48

```
slot 1:  Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
         IsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
         IqmC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
         Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
         IsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
         IqmC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
```

Controleer of het controleverkeer stroomt vanuit een ASIC-perspectief van een lijnkaartstub tussen de Line Card Stub ASIC op de lijnkaart en de Supervisor Forwarding ASIC op de actieve en stand-by Supervisors via de OCI-interfaces.

- OCI = Out-of-band Control Interface = interne communicatiekanalen tussen de lijnkaart en actieve en stand-by supervisors

<#root>

C9400#

```
show platform hardware iomd 1/0 oci status ---> slot 1
```

```
Asic 0, Mac 10, Tx OCI Config 0, OCI Merge FALSE, OCI Enabled, Link Status 0 (UP)
Network Port Range 0---47, Local Port Range 0---47
NifRxByteGroupStats:  rxBytes 177402572782108          NifTxByteGroupStats:  txBytes 141925777717156

Asic 0, Mac 11, Tx OCI Config 0, OCI Merge FALSE, OCI Enabled, Link Status 0 (UP)
Network Port Range 0---47, Local Port Range 0---47
NifRxByteGroupStats:  rxBytes 963489284              NifTxByteGroupStats:  txBytes 770809988
```

Controleer welke interfaces op de lijnkaart deel uitmaken van dezelfde poortgroep die 8 Gbps bandbreedte deelt van de Line card stub ASIC op de lijnkaart naar de Supervisor Forwarding ASIC op de actieve Supervisor. Elke poortgroep is gekoppeld aan een van de SLI (System Link Interface) op de Line Card Stub ASIC naar de Supervisor.

<#root>

C9400#

```
show platform hardware iomd 1/0 portgroups ---> slot 1
```

```
Port  Interface                               Status  Interface
Group Max  <-- aggregate bandwidth for 8 ports

Group                               Bandwith
```

Bandwidth

1	TenGigabitEthernet1/0/1	up	1G	
1	TenGigabitEthernet1/0/2	down	1G	
1	TenGigabitEthernet1/0/3	admindown	1G	
1	TenGigabitEthernet1/0/4	down	1G	
1	TenGigabitEthernet1/0/5	down	1G	8G
1	TenGigabitEthernet1/0/6	down	1G	
1	TenGigabitEthernet1/0/7	down	1G	
1	TenGigabitEthernet1/0/8	down	1G	
2	TenGigabitEthernet1/0/9	down	1G	
2	TenGigabitEthernet1/0/10	down	1G	
2	TenGigabitEthernet1/0/11	down	1G	
2	TenGigabitEthernet1/0/12	down	1G	
2	TenGigabitEthernet1/0/13	up	1G	8G
2	TenGigabitEthernet1/0/14	down	1G	
2	TenGigabitEthernet1/0/15	down	1G	
2	TenGigabitEthernet1/0/16	down	1G	
3	TenGigabitEthernet1/0/17	down	1G	
3	TenGigabitEthernet1/0/18	down	1G	
3	TenGigabitEthernet1/0/19	down	1G	
3	TenGigabitEthernet1/0/20	down	1G	
3	TenGigabitEthernet1/0/21	down	1G	8G
3	TenGigabitEthernet1/0/22	down	1G	
3	TenGigabitEthernet1/0/23	down	1G	
3	TenGigabitEthernet1/0/24	down	1G	
4	TenGigabitEthernet1/0/25	down	1G	
4	TenGigabitEthernet1/0/26	down	1G	
4	TenGigabitEthernet1/0/27	down	1G	
4	TenGigabitEthernet1/0/28	down	1G	
4	TenGigabitEthernet1/0/29	down	1G	8G
4	TenGigabitEthernet1/0/30	down	1G	
4	TenGigabitEthernet1/0/31	down	1G	
4	TenGigabitEthernet1/0/32	down	1G	
5	TenGigabitEthernet1/0/33	down	1G	
5	TenGigabitEthernet1/0/34	down	1G	
5	TenGigabitEthernet1/0/35	down	1G	
5	TenGigabitEthernet1/0/36	down	1G	
5	TenGigabitEthernet1/0/37	down	1G	8G
5	TenGigabitEthernet1/0/38	down	1G	
5	TenGigabitEthernet1/0/39	down	1G	
5	TenGigabitEthernet1/0/40	down	1G	
6	TenGigabitEthernet1/0/41	down	1G	
6	TenGigabitEthernet1/0/42	down	1G	
6	TenGigabitEthernet1/0/43	down	1G	
6	TenGigabitEthernet1/0/44	down	1G	
6	TenGigabitEthernet1/0/45	down	1G	8G
6	TenGigabitEthernet1/0/46	down	1G	
6	TenGigabitEthernet1/0/47	down	1G	
6	TenGigabitEthernet1/0/48	up	1G	

## Over deze vertaling

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