

# Detecteer Layer 2 hardware op Catalyst 9000 Series Switches

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## Inleiding

Dit document beschrijft hoe u Layer 2 hardware-programmering en -verzending kunt valideren op Catalyst 9400 Series switches.

## Voorwaarden

## Vereisten

Er zijn geen specifieke vereisten van toepassing op dit document.

## Gebruikte componenten

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

**Opmerking:** De softwareversie die in dit document wordt gebruikt, is 16.6.1. Deze versie blijft echter van toepassing voor latere versies van Cisco IOS-XE.

**Opmerking:** U kunt dit document gebruiken voor andere typen Catalyst 9000 switches, maar u kunt geen opdracht negeren waarin naar een lijnkaart wordt verwezen.

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 supervisor 1 (C9400-SUP-1) heeft 3 UADP 2.0 UADP 2.0 UPTS ASIC's (0, 1, 2).
- Elke UADP 2.0 verzendASIC heeft: Een dual Core (0, 1) - deze bestond niet in eerdere generaties van UADP 2.0 ASICs. SIFs (Stack Interfaces) - gebruikt om verbinding te maken met de andere 2 UADP 2.0 ASIC's via een interne stackring. NIF's (Network Interfaces) - gebruikt voor de aansluiting op 1 of meer lijnkaarten via de backplane.
- Alle pakket die besluiten voor de kaarten van de Lijnkaart en de van de Supervisor uplink interfaces worden gemaakt door de 3 UADP 2.0 die ASICs op de actieve supervisor door te sturen.
- De lijnkaarten die in dit voorbeeld worden gebruikt hebben 1 lijnkaart enkele kern stub ASIC die niet bij pakket het verzenden besluiten betrokken is.
- De lijnkaartstap ASIC op de lijnkaart sluit aan op 1 of meer van de 3 UADP 2.0 die ASICs op de supervisor via het backplane door te sturen.
- De 3 UADP 2.0 die ASICs op de supervisor door te sturen maken alle pakket besluiten.

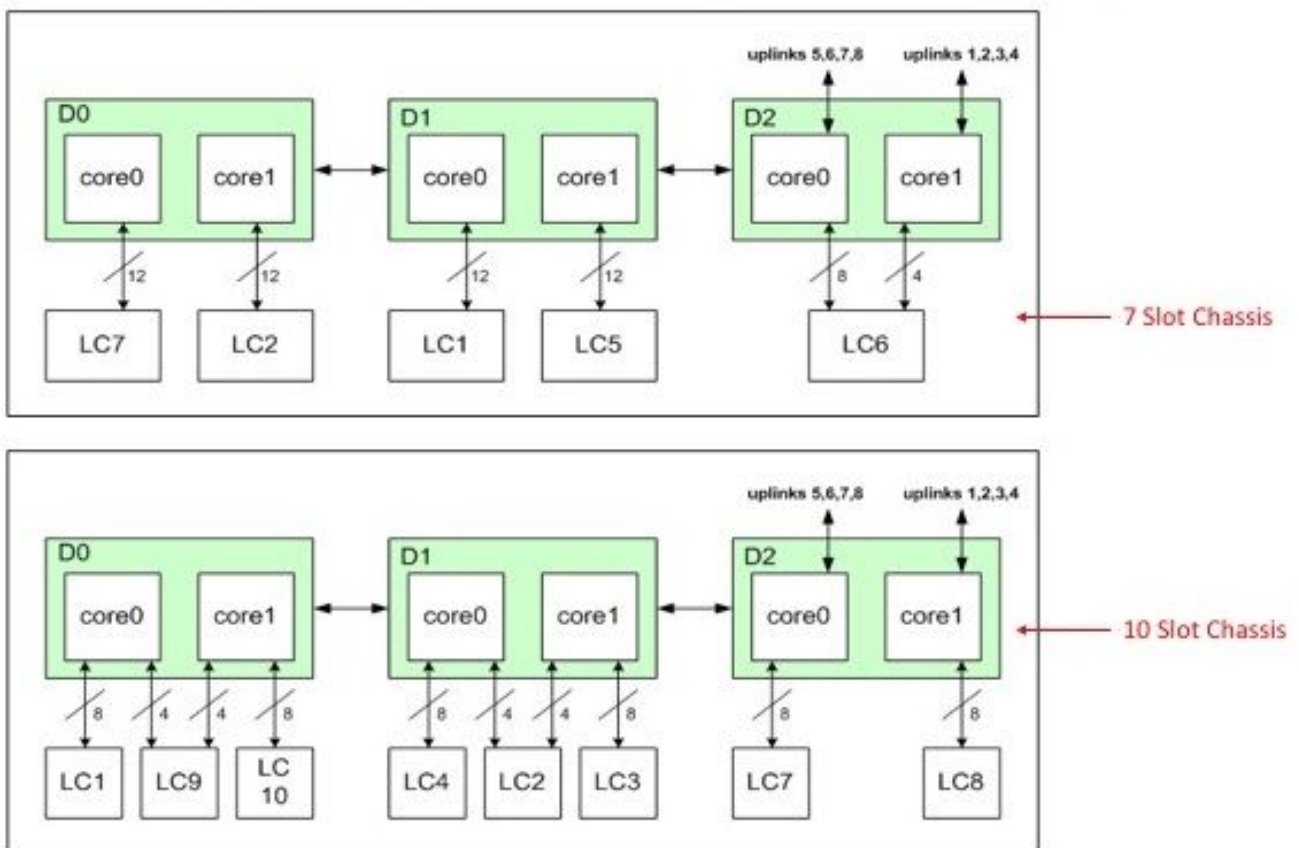
## Terminologie

acroniem	Definitie
RP	routeprocessor
KP	Doorvoerprocessor
FED	Stuurprogramma doorsturen. Het softwareproces dat de Supervisor Forwarding ASIC omv
Objectmanag er	FP software MAC-items die als asynchrone objecten in de doeldatabase worden opgeslag
LSMPI	Linux Shared Memory Point Interface Het transport tussen het gegevensvliegtuig (hardwar

	UADP 2.0) en het besturingsplane (software-CPU).
IFM	Software voor interfacebeheer.
IF_ID	Interface IDentifier is een unieke waarde die een specifieke interface representeert. Het wordt gebruikt tijdens interne programmering in de switch.
Instellen	Bijvoorbeeld. Geeft aan dat de UADP 2.0 Asic/Core-interface is aangesloten op: 0=Asic0/Core0, 1=Asic0/Core1, 2=Asic1/Core0, 3=Asic1/Core1, 4=Asic2/Core0, 5=Asic2/Core1.
Aziatisch	Specificeert welke UADP 2.0 een interface met: 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 gekoppeld aan: 0=kern0, 1=kern1.
Port	Ordinaal nummer van een haven in een sleuf. Binnen dezelfde sleuf zijn alle poortnummers uniek.
Subpoort	Identificeert een haven binnen een havengroep (Cntx) voor voorpaneelpoorten die worden gesubporteerd (Cntx & SubPort samen een unieke haven die wordt Sub-porteerd).
Mac	Interface identifier die wordt gebruikt wanneer een interface MACsec (security verificatie en encryptie) draait.
Cntx	Context. Een groepsnummer dat een poort behoort tot wanneer een interface op het voorpaneel wordt gesubporteerd (Cntx & SubPort samen identificeren een unieke haven die wordt Sub-porteerd).
LPN	Logisch poortnummer gekoppeld aan een interface.
GPN	Mondiaal poortnummer gekoppeld aan een interface.
type NIF	Netwerkinterface; NRU = Network Redundant Uplink
IF_IS	Interface-IDentifier. Dit is een unieke waarde die een specifieke interface representeert. Het wordt gebruikt tijdens verschillende programma's intern in de switch.
PoortLE	Logische entiteit van de haven. Dit is de interfaceconfiguratie.
AOM	Asynchrone objectmanager. De informatie over de KP-programma's in de doeldatabase als object.
VP	Virtuele poort
MATM	MAC-adrestabelbeheer
RP	routeprocessor
OM_PTR	Pointer om object Manager
Tbl_ID	Tabelidentificator = vlan
CMAN	Chassis Manager
KP	Doorvoerprocessor
fp_port	De voorpaneelpoorten.
Sif	Stack interface (naar de andere 2 UADP 2.0 die ASIC's op de supervisor doorsturen).
Nif	Netwerkinterface (naar de interface van het voorpaneel)
IGR/EGR	Ingoers / egress
IQS	Ingraving Wachtende wachtrij
QO	Stack Queue Scheduler
PBC	Packet Buffer-complex
AQM	Actief beheer van de wachtrij. Dit controleert congestiebeheer.
AQMRed	Actieve vroegtijdige detectie van wachtrijbeheer.
EQC	IP-wachtrij
ESM	Edge-planningsbeheer

RWE	Herschrijfmachine. Voert veldnameninformatie toe of verwijdert deze uit het pakket.
IOMD	Stuurprogramma voor ingangsmodule
fp_port	De voorpaneel poort.
Nif	Netwerkinterface (naar de interface van het voorpaneel)
SLI	System Link Interface (naar supervisor)
IGR / EGR =	Ingoers / egress
AQMRed	Actieve vroegtijdige detectie van wachtrijbeheer.
OCI	Out-of-band regelinterface = intern communicatiekanaal tussen de lijnkaart en actieve supervisor
MATM	MAC-adrestabelbeheer
MAC-verplaatsing aantal	Dit is de telling voor wanneer een adres van MAC zich op een nieuwe interface beweegt (verleerd). De bewegingtel kan voorkomen wanneer een eindhost fysiek van de ene interface naar de andere wordt verplaatst, een draadloos host-venster van het ene Access Point (AP) naar een andere AP die op een andere interface is aangesloten, of de overspannend-tree veranderingen of loops.

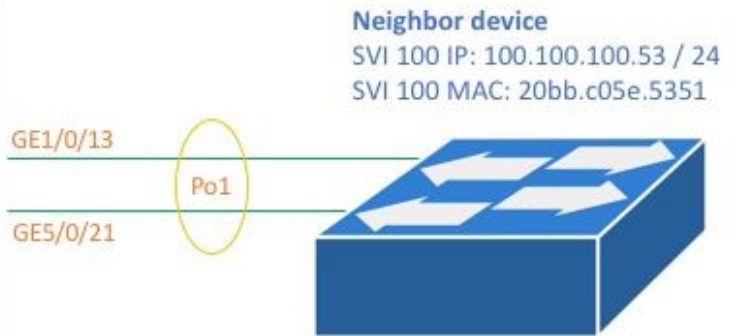
## Line Card (LC) to UADP 2.0 Mapping



Lijnkaart voor UADP

## Topologie

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



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 (fc2)
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--
```

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

C9400#show running-config interface port-channel 1

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

```
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
```

```
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
```

```
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 van het show platform kunnen vereisen dat de opdracht voor interne configuratie van de service in de verklaring is opgenomen.

## Interfaceprogrammering

### Toewijzing van interface naar UADP 2.0

De opdracht Interfaceprogrammeur toont de interface-afbeelding van het voorpaneel voor alle Lijnkaarten aan één van de 3 UADP 2.0 die ASIC op de actieve supervisor door maakt.

### Uitloopvoorbeeld

Dit voorbeeld toont aan dat:

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

```
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 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 interfaceprogramma

De opdracht Show platform geeft de configuratiegegevens van de software weer voor Gig1/0/3 op basis van de IF\_ID waarde in het vorige opdrachtvoorbeeld.

```
C9400#show platform software fed active ifm if-id 0x13
Interface IF_ID : 0x00000000000000013
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 hardwareconfiguratie van Gig1/0/3 weer, gebaseerd op de PORT\_LE waarde van de vorige opdracht.

<b>Waarde</b>	<b>Definitie</b>
Waarde 0	De waarde wordt niet ingesteld.
Waarde 1	De waarde wordt in de meeste gevallen ingesteld.

```

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-ftr-id:LKP_FEAT_INGRESS_PRECLASS1_IPV4 ref_count:1
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index2:0xc mtu_index/13u_ri_index2:0x4 sm
handle [ASIC 2]: 0x7fe5c5abb588

```

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--

```

## Ethernet-programma

In deze EtherChannel-programmeervoorbeeldoutput, de RP-programma's, de FP-programma's, de FED-programma's en vervolgens de ASIC-hardware van de supervisor doorsturen. De RP-softwareingangen worden als objecten in de doeldatabase opgeslagen en de FP-softwareingangen worden als asynchrone objecten in de doeldatabase opgeslagen.

```

C9400#show etherchannel summary
--snip--
Group  Port-channel  Protocol  Ports
-----+-----+-----+-----
1      Po1(SU)        LACP      Gi1/0/13(P) Gi5/0/21(P)

```

Het groepsmasker is een niet-nul in deze uitvoer. Het wordt in het hashproces gebruikt om de koppeling in het Ethernet-kanaal te bepalen waar een verkeersstroom zich beperkt.



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-channell	748	0
-snip-		

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

Deze opdracht toont de configuratie voor poortkanaal 1:

C9400#show platform software fed active ifm if-id 0x000002ec

Interface IF\_ID : 0x00000000000002ec

Interface Name : Port-channell

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

Index[3] : 000000000000008f ---> 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, core 0)**

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, core 1)**

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

Deze opdracht toont de configuratie voor mapping interfaces.

**Acroniem/instantie Definitie**

**IFM** Interface Manager

**voorbeeld** Gig1/0/13 is op ASIC-exemplaar 2 (UADP 2.0 ASIC 1, kern 0) met interface-ID 0x13

**voorbeeld** Gig5/0/21 is gebaseerd op ASIC-exemplaar 3 (UADP 2.0 ASIC 1, kern 1) met interface-ID 0x8f

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 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--
```

**Mondiale Ethernet-configuratie**

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 which etherchannel member link it is sent out on**

```
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)
```

```
C9400#show platform software object-manager fp active object 27  
Object identifier: 27  
Description: EtherChannel global configuration object  
Status: Done, Epoch: 0, Client data: 0x792e6e28
```

## VLAN-programmering

```
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 10

Deze opdracht geeft de instellingsdetails voor de hardwareconfiguratie voor VLAN 100 weer.

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

```
C9400#show platform hardware fed active fwd-asic abstraction print-resource-handle  
0x00007fe5c4616ef8 1  
Handle:0x7fe5c4616ef8 Res-Type:ASIC_RSC_VLAN_LE Res-Switch-Num:255 Asic-Num:255 Feature-  
ID:AL_FID_L2 Lkp-ftr-id:LKP_FEAT_INVALID ref_count:1  
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index0:0xa mtu_index/l3u_ri_index0:0x0 sm  
handle [ASIC 0]: 0x7fe5c461c1d8 index1:0xa mtu_index/l3u_ri_index1:0x0 sm handle [ASIC 1]:  
0x7fe5c461d688 index2:0xa mtu_index/l3u_ri_index2:0x0 sm handle [ASIC 2]: 0x7fe5c461eb38  
index3:0xa mtu_index/l3u_ri_index3:0x0 index4:0xa mtu_index/l3u_ri_index4:0x0 index5:0xa  
mtu_index/l3u_ri_index5:0x0  
Cookie length: 56  
00 00 00 00 00 00 00 00 64 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  
Detailed Resource Information (ASIC#0) ----> ASIC instance 0 = Supervisor ASIC 0, core 0  
--snip--  
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  
-----  
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-programma

```
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-channell) 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 Pol Root FWD 3 128.2473 P2p Peer(STP)

```

```
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 het overspannen van bomen door voor Port-Channel 1.

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
Port-channel1	748	0

C9400#show platform software fed active vp summary interface if\_id 748

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

De volgende opdrachten tonen de overspannende hardware-doorvoerstatus voor VLAN 100.

C9400#show platform software fed active vp summary vlan 100

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

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

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 op stabiliteit in de omspanning. Zorg ervoor dat de meldingen van wijziging van de topologie (TCN) niet vaak worden gezien.

```
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-channell), 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-channell
  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

```
C9400#show etherchannel summary
```

```
--snip--
```

```
Group Port-channel Protocol Ports
```

```
-----+-----+-----+-----
1      Po1(SU)        LACP      Gi1/0/13(P) Gi5/0/21(P)
```

```
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
```

```
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
```

## Software programmeren

In de volgende uitvoerforbeelden, worden de RP-programma's het FP, de FP-programma's de FED, de FED, vervolgens programma's van de supervisor die ASIC-hardware doorstuurt. De RP-software MAC-ingangen worden opgeslagen als objecten in de doeldatabase en de FP-software MAC-ingangen worden als asynchrone objecten in de doeldatabase opgeslagen.

```
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
```

```
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-		

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
```

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

C9400#show platform software fed 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
GigabitEthernet1/0/1
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_OPQ_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
```

## MCHandle programmeerbaarheid

Acroniem/term Definitie

VLAN:10 MVID 10. VLAN 100 gebruikt intern toegewezen VLAN ID (MVID) 10 in de switch.

gpn:1104 Mondiaal poortnummer van poortkanaal 1.

mac:0x20bc0 MAC-adres 20b.c05e.5351

5e5351

Dit is een MacHandle Programming uitvoerbeeld:

```
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 Lkp-ftr-id:LKP_FEAT_L2_SRC_MAC_VLAN ref_count:1
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: handle [ASIC: 0]: 0x7fe5c6aed898 handle
[ASIC: 1]: 0x7fe5c6b00fd8 handle [ASIC: 2]: 0x7fe5c6858208
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: 0 client_home_asic: 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_home_asic: 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 auth_state:0 auth_mode:0 auth_behavior_tag:0 traf_m:0 is_src_ce:0
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_mask_o:0 afd_cli_f:0 afd_lbl:0 prio:3 dest_mod_idx:0 destined_to_us:0 pv_trunk:1 smr:0
Detailed Resource Information (ASIC#1) --snip-- Detailed Resource Information (ASIC#2) --snip--
```

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	0x000000000000002ea 10

C9400#show platform software fed active ifm mappings etherchannel

Mappings Table

Chan	Interface	IF_ID
1	Port-channel1	0x000002ec

C9400#show platform software fed active ifm if-id 0x000002ec <-- IF\_ID from previous output

```
Interface IF_ID : 0x000000000000002ec
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 waarop mac werd geleerd was één interface in plaats van een poortkanaal, wordt deze opdracht gebruikt om het GPN te bepalen om interfacekaart toe te passen

```
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--

```

## Programmeerprogramma

**Acroniem/term**      **Definitie**

siHandle      Station Index Handle. Het pakket herschrijft informatie (RI = Herschrijfindex) en uitgaande interface-informatie (DI = Destination Index).

Dynamic Bitmap voor dual core op Single Supervisor ASIC:

<b>Acroniem/term</b>	<b>Definitie</b>
Lokale ASIC (LD = lokale gegevens)	Bestemming op dezelfde ASIC op dezelfde kern als bron.
Core-kopie (CD = Core Data)	Bestemming op dezelfde ASIC op een andere kern.
Afstandsbediening (RD = afstandsgegevens)	Bestemming op een andere ASIC.

```
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_IPV4 Lkp-ftr-id:LKP_FEAT_INVALID ref_count:2
priv_ri/priv_si Handle: 0x7fe5c6864938Hardware Indices/Handles: index0:0xcd
mtu_index/l3u_ri_index0:0x0 index1:0xcd mtu_index/l3u_ri_index1:0x0 index2:0xcd
mtu_index/l3u_ri_index2:0x0 index3:0xcd mtu_index/l3u_ri_index3:0x0 index4:0xcd
mtu_index/l3u_ri_index4:0x0 index5:0xcd mtu_index/l3u_ri_index5:0x0
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 00 00 00 00 00 00 07 00 20 bb c0 5e 53 51 00 00 00 00
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 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--
```

```
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)
cmil = 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)
cmil = 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--
```

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--												

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-herschrijfinformatie omdat dit een Layer 2 MAC-doorvoeringang is.

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--
```

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
```

# Dihandvatprogramma

acroniem  
diHandle

Definitie  
bestemmingsindex Handle. Dit is de uitgaande interface-informatie.

```
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-ftr-id:LKP_FEAT_INVALID ref_count:21
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index0:0x51c2 mtu_index/l3u_ri_index0:0x0
index1:0x51c2 mtu_index/l3u_ri_index1:0x0 index2:0x51c2 mtu_index/l3u_ri_index2:0x0
index3:0x51c2 mtu_index/l3u_ri_index3:0x0 index4:0x51c2 mtu_index/l3u_ri_index4:0x0
index5:0x51c2 mtu_index/l3u_ri_index5:0x0
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)

cmil = 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)

cmil = 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--

```
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 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--
```

C9400#**show etherchannel summary**

--snip--

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

## Hardware-programmering - Methode 2

<b>Acroniem/term</b>	<b>Definitie</b>
VLAN:10	MVID 10. VLAN 100 gebruikt intern toegewezen VLAN ID (MVID) 10 in de switch.
gpn:1104	Mondiaal poortnummer van poortkanaal 1.
mac:0x20bc05e5351	MAC-adres 20b.c05e.5351

Hardware programmeermethode 2, voorbeelduitvoer:

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, client_home_asic 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_home_asic 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, auth_state 0, auth_mode 0, traf_mode 0, is_src_ce 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_mask_o 0, afd_cli_f 0, afd_lbl 0, priority 3, dest_mod_idx 0, destined_to_us 0, pv_trunk
1
--snip--
```

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
MVID					
-----	-----	-----	-----	-----	-----
100	0x0000000000420011	0x00007fe5c4616ef8	0x00007fe5c4617778	0x00007fe5c50dac28	0x00000000000002ea 10

C9400#**show platform software fed active ifm mappings etherchannel**

Mappings Table

Chan	Interface	IF_ID
-----	-----	-----
1	Port-channell	0x000002ec

--snip--

C9400#**show platform software fed active ifm if-id 0x000002ec**

```
Interface IF_ID : 0x00000000000002ec
Interface Name : Port-channell
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 op één interface in plaats van een poortkanaal was de volgende opdracht gebruikt om de gpn te bepalen om interfacekaart te maken:

```

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-toepassingen

Controleer het TCAM-gebruik voor de MAC-adreangen op elke ASIC-instantie van de supervisor om er zeker van te zijn dat de switch geen TCAM-ruimte meer heeft om items in hardware op te slaan.

```

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	-----> prefix/mask
----- Unicast MAC addresses 65536/1024 <b>13/1</b> ----->			
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 een mac-adres, een interface, een VLAN enzovoort is) worden opgeslagen in de objectdatabase en geprogrammeerd in de hardware als objecten.

De RP-programma's voor het KP, de KP-programma's voor de FED en de FED, en daarna ten slotte programma's voor het doorsturen van ASIC-hardware door de toezichthouder. RP software-ingangen worden als objecten in de doeldatabase opgeslagen en de FP software-ingangen worden als asynchrone objecten in de doeldatabase opgeslagen.

Wanneer de FED de FED programma's uitvoert (die op hun beurt de supervisor doorstuurt ASIC), stuurt de FED een bevestiging terug naar het KP. Het KP zendt het vervolgens naar de RP om aan te geven dat de hardwareprogrammering succesvol is voltooid. Als de FED-hardwareprogrammering ontbreekt of niet correct is, kunt u deze volgende opdracht gebruiken om problemen en/of kennisgevingen te controleren.

```
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-nulobjecten in hangende uitgiftestatus toont, gebruik deze opdracht om het betrokken objectnummer te vinden:

```
C9400#show platform software object-manager fp active pending-issue-update
```

Gebruik dan deze opdracht om het vast proces te bepalen dat aan het objectnummer is gekoppeld:

```
C9400#show platform software object-manager fp active object {object#}
```

Aan de kant van RP, gebruik deze opdracht om hangend (Del Pend) wissen te controleren voor een object dat het FP niet erkende.

```
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_dpidb 164 0 10 CHANNEL_DPIDB  
channel_dpidb 0 0 12 VIRTUAL_DPIDB virtual_dpidb 503 0 13 SW_DPIDB sw_dpidb 0 0 17 VLAN vlan 0 0  
19  
--snip--
```

## Gezondheidscontrole

### Verkeer en beleid van besturingsplane

Controleer of de CoPP (Control Plane Policy) in hardware-UADP 2.0 is gedaald voor verkeer dat is gericht op software-CPU. Dit kan van invloed zijn op het leren van MAC en de stabiliteit van de Spanning-boom.

```
C9400#show policy-map control-plane
```

```
Control Plane
```

```
Service-policy input: system-cpp-policy
```

```
--snip--
```

```
Class-map: system-cpp-police-sw-forward (match-any)  
0 packets, 0 bytes  
5 minute offered rate 0000 bps, drop rate 0000 bps  
Match: none  
police:  
rate 1000 pps, burst 244 packets  
conformed 1298 bytes; actions:  
transmit  
exceeded 0 bytes; actions:  
drop
```

```
--snip--
```

```
Class-map: system-cpp-police-l2-control (match-any)  
0 packets, 0 bytes  
5 minute offered rate 0000 bps, drop rate 0000 bps  
Match: none  
police:  
rate 500 pps, burst 122 packets  
conformed 239197001 bytes; actions:  
transmit  
exceeded 0 bytes; actions:  
drop
```

```
--snip--
```

```
Class-map: system-cpp-default (match-any)
```



```

0 packets, 0 bytes
5 minute offered rate 0000 bps, drop rate 0000 bps
Match: none
police:
    rate 1000 pps, burst 244 packets
    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

```

Dezelfde CoPP-uitvoer als het vorige voorbeeld wordt hier in een korter en eenvoudiger om te lezen (gecomprimeerd) formaat weergegeven.

C9400#show platform hardware fed active qos queue stats internal cpu policer

CPU Queue Statistics

```

=====
                                (default) (set)
QId PlcIdx Queue Name           Enabled Rate Rate Queue Queue
                                Drop(Bytes) 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 Index	Policer Accept Bytes	Policer Accept Frames	Policer Drop Bytes	Policer Drop 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 Exception/NFL SAMPLED DATA/Gold Pkt/RPF Failed/
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 CPU-puntpad (hardware-UADP 2.0 naar software-CPU) vanuit een CPU-perspectief.

```
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 protcol 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

**Lsmpl11/3 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

C9400#show platform software infrastructure lsmpl punt

LSMPI punt statistics

```

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

```

Cause	Total	Total	Length	Dot1q encap	
Other	SKB	consumed	forwarded	error	exceeded
linktype	invalid				
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 CPU-injectiepad (software-CPU naar hardwaresupervisor) vanuit een CPU-perspectief.

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 dhcp

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 CPU punt/injectiestatistieken vanuit een FED-perspectief (UADP 2.0).

```
C9400#show platform software fed active lsmapi 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-punt pad (hardware-supervisor naar software-CPU) vanuit een FED-perspectief (supervisor).

```
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-wachtrijen vanuit een FED-perspectief (supervisor).

```
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

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 Supervisor forwarding ASICs
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 het CPU-injectiepad (software-CPU naar hardwaresupervisor) vanuit een FED-perspectief (supervisor).

```

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-injectiegrenzen vanuit een FED-perspectief (UADP 2.0).

```

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-tabel

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
```

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

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



```
C9400#show mac address-table notification mac-move
```

```
MAC Move Notification: enabled
```

```
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 Exceptiefjes

Deze opdracht specificeert om het even welke redenen dat een UADP 2.0 die ASIC doorstuurt een pakket laat vallen:

```
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 IPV4_CHECKSUM_ERROR 0 0 0 0 ROUTED_AND_IP_OPTIONS_EXCEPTION 0 0 0 0  
CTS_FILTERED_EXCEPTION 0 0 0 0 SIA_TTL_ZERO 0 0 0 0 ALLOW_NATIVE_EXCEPTION_COUNT 0 0 0 0  
ALLOW_DOT1Q_EXCEPTION_COUNT 0 0 0 0 ALLOW_PRIORITY_TAGGED_EXCEPTION_COUNT 0 0 0 0  
ALLOW_UNKNOWN_ETHER_TYPE_EXCEPTION 0 0 0 0 IP_SOURCE_GUARD_VIOLATION 0 0 0 0  
SECURE_L3IF_LEARNING_VIOLATION 0 0 0 0 AUTH_DRIVEN_DROP 0 0 0 0 VLAN_LOADBALANCE_GROUP_DENY  
0 0 0 0 RPF_UNICAST_FAIL 0 0 0 0 RPF_UNICAST_FAIL_SUPPRESS 0 0 0 0  
RPF_UNICAST_CHECK_INCOMPLETE 0 0 0 0 RPF_MULTICAST_FAIL 0 0 0 0 PKT_DROP_COUNT 0 0 0 0  
SOURCE_ROUTE_EXCEPTION 0 0 0 0 IGR_MISC_FATAL_ERROR 0 0 0 0 BLOCK_FORWARD 0 0 0 0  
POLICER_DROP 0 0 0 0 DENY_ROUTE 0 0 0 0 DENY_BRIDGE 0 0 0 0 STATIC_MAC_VIOLATION 0 0 0 0  
STATIC_IP_VIOLATION 0 0 0 0 FPM_DROP_PACKET 0 0 0 0 IGR_EXCEPTION_L4_ERROR 0 0 0 0  
IGR_EXCEPTION_L5_ERROR 0 0 0 0 IGR_EXCEPTION_HARDWARE_PARSE_EXCEPTION 0 0 0 0  
IGR_EXCEPTION_INVALID_VLAN_DROP 0 0 0 0 IGR_EXCEPTION_31 0 0 0 0  
FRAGMENTING_IPV4_WITH_OPTIONS 0 0 0 0 FRAGMENTING_IPV6_WITH_EXTENSIONS 0 0 0 0 ICMP_REDIRECT  
0 0 0 0 MTU_FAIL_PUNT_TO_CPU_NO_IP_UNREACHABLE 0 0 0 0  
LINK_LOCAL_CHECK_FAIL_NO_IP_UNREACHABLE 0 0 0 0 IP_UNICAST_TTL_REACHED_ZERO 0 0 0 0  
MISC_FATAL_ERROR 0 0 0 0 STP_OR_FLEXLINK_DROP 0 0 0 0 PROTECTED_PORT_DROP 0 0 0 0  
PVLAN_ISOLATED_CHECK_FAILED 0 0 0 0 PVLAN_COMMUNITY_CHECK_FAILED 0 0 0 0  
DEJA_VU_CHECK_FAILED 0 0 0 0 NOT_VLAN_LOAD_BALANCE_GROUP_ALLOWED 0 0 0 0 RSPAN_DROP 0 0 0 0  
0 SPLIT_HORIZON_DROP 0 0 0 0 SYSTEM_TTL_DROP 0 0 0 0 PRUNED 0 0 0 0 DENY_NO_IP_UNREACHABLE  
0 0 0 0 IP_MULTICAST_TTL_REACHED_ZERO 0 0 0 0 MTU_FAIL_DROP_BRIDGED 0 0 0 0  
MTU_FAIL_DROP_BRIDGED_IP_ROUTED 0 0 0 0 MTU_FAIL_ERSPAN 0 0 0 0  
LINK_LOCAL_CHECK_FAIL_L3M_VALID 0 0 0 0 DENY_NOT_NO_IP_UNREACHABLE 0 0 0 0  
MTU_FAIL_PUNT_TO_CPU_NOT_NO_IP_UNREACHABLE 0 0 0 0 LINK_LOCAL_CHECK_FAIL_NOT_NO_IP_UNREACHABLE  
0 0 0 0 COPY_TO_CPU 0 0 0 0 EGR_L3_ERROR 0 0 0 0 EGR_L4_ERROR 0 0 0 0 EGR_L5_ERROR 0 0 0  
0 0 EGR_HARDWARE_PARSE_EXCEPTION 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 Statistics - Supervisor to Line Card Data Path

Controleer de actieve supervisor UADP 2.0 die ASIC statistieken door zal sturen die met een specifieke interface van het voorpaneel worden geassocieerd. In dit voorbeeld wordt de interface Gig1/0/13 gebruikt.



NifRxPortStatusGroupStats:		NifTxPortStatusGroupStats:	
rxCollisionFragments	0	txLateCollisionFrames	0
rxFcsErrorFrames	0	txsystemFcsErrorFrames	0
rxInvalidOversizeFrames	0	txOversizeFrames	0
rxMacOverrunFrames	0	txMacUnderrunFrames	0
rxIpgViolationFrames	0	txDeferredFrames	0
rxOamDroppedFrames	0	txExcessiveDeferralFrames	0
rxSymbolErrorFrames	0	txOkMultipleCollisionFrames	0
rxValidOversizeFrames	0	txOkSingleCollisionFrames	0
rxValidUndersizeFrames	0	goldFramesTruncated	0
NifRxSizeGroupStats:		NifTxSizeGroupStats:	
rx32768toMtuFrames	0	tx32768toMtuFrames	0
rx16384to32767ByteFrames	0	tx16384to32767ByteFrames	0
rx8192to16383ByteFrames	0	tx8192to16383ByteFrames	0
rx4096to8191ByteFrames	0	tx4096to8191ByteFrames	0
rx2048to4095ByteFrames	0	tx2048to4095ByteFrames	0
rx1519to2047ByteFrames	51	tx1519to2047ByteFrames	0
rx1024to1518ByteFrames	15	tx1024to1518ByteFrames	0
rx512to1023ByteFrames	17	tx512to1023ByteFrames	187
rx256to511ByteFrames	3406	tx256to511ByteFrames	9407
rx128to255ByteFrames	6567	tx128to255ByteFrames	6580
rx65to127ByteFrames	11295	tx65to127ByteFrames	8583
rx64ByteFrames	18362	tx64ByteFrames	18458

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

IgrPacketCounters:		EgrPacketCounters:	
packetsIn	97777	packetsIn	580324
packetsOut	97777	packetsEnqueueFcd_val	0
packetsDropped	3383	packetsMarkedForDrop	278
fpsSourcedPadErrorCount	0	padErrorPacketsIn	0
igrSourcedPadErrorCount	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:

**---> Output queue (Aqm = Active queue management)**

<b>AqmRedQueueStats:</b>		<b>(sum of all queues)</b>
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:
  iCount          0
  iCount          0
PbcCreditCount:
  creditCount     64
  rwePbcStall    0
PbcEgressErrorDropCount:
  eS0Count        0
  eS1Count        0
PbcEnqFcErrorDropCount:
  fCount          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:
  SifRacInsertedCnt[0]  2295051
  SifRacInsertedCnt[1]  1738892
  SifRacInsertedCnt[2]  1666479
  SifRacInsertedCnt[3]  2773364
  SifRacInsertedCnt[4]  3126116
  SifRacInsertedCnt[5]  2066567
SifRacCopiedCnt:
  SifRacCopiedCnt[0]    35850468
  SifRacCopiedCnt[1]    19265491
  SifRacCopiedCnt[2]    23814855
  SifRacCopiedCnt[3]    32727259
  SifRacCopiedCnt[4]    38376676
  SifRacCopiedCnt[5]    22176467
=====
For Sif 1 Switching:
SifSifPbcCnt0:
  Count           40956521
SifSifPbcCnt1:
  Count           40956521
SifRacInsertedCnt:
  SifRacInsertedCnt[0]  11713808
  SifRacInsertedCnt[1]  8319576
  SifRacInsertedCnt[2]  8816344
  SifRacInsertedCnt[3]  15404080
  SifRacInsertedCnt[4]  16161715
  SifRacInsertedCnt[5]  9745420
SifRacCopiedCnt:
  SifRacCopiedCnt[0]    8615615
  SifRacCopiedCnt[1]    7489596
  SifRacCopiedCnt[2]    7608895
  SifRacCopiedCnt[3]    8717898
  SifRacCopiedCnt[4]    9685735
  SifRacCopiedCnt[5]    7866174

```

Controleer de stroombeheerstatus vanuit een Supervisor perspectief voor de interface van het voorpaneel. Dit helpt u te identificeren of er opstopping is.

```

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 dat het controleverkeer vanuit een supervisor die ASIC-perspectief doorstuurt tussen de supervisor die ASIC doorstuurt op de actieve supervisor en de lijnkaartstap ASIC op de lijnkaart via de OCI-interfaces stroomt.

```
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
588911286106332

```

```

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
588917607864892

```

```

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
588915422236932

```

```

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 voor lijnkaart - supervisor naar lijnkaartpad

Controleer de ASIC-statistieken van de lijnkaartkaart die bij een specifieke frontpaneelinterface zijn aangesloten. In dit voorbeeld is de focus van de interface Gig1/0/13.

### Uitloopvoorbeeld:

- Packets die worden ontvangen van Gig 1/0/13 gaan de netwerkinterface in die poort en voortgang door IQS naar de stapelinterface ontvangt.
- Van daaruit gaat een pakket ofwel de stapel interface naar een andere supervisor ASIC uit, of komt terug door de SQL, AQM, EQC, ESM, RWE, en dan gaat de Network Interface verzenden van Gig 1/0/13.

- Packets die vanuit andere ASICs-interfaces van supervisor worden verzonden en die uit Gig 1/0/13 geraken, gaan Sif in en gaan dan door SQL, AQM, EQC, ESM, RWE en dan de NifTx van Gig 1/0/13.
- Voor AQM zijn er 8 TX-wachtrijen. Als je druppels uit deze wachtrijen ziet, kan je deze opdracht gebruiken om te bepalen welke wachtrijen vallen ervaren: Toon platform hardware-feed active wachtrij stats interface Gig 1/0/13

C9400#show platform hardware iomd 1/0 data-path 13 detail ----> slot 1, interface 13

lcportmap.xml: ----> Line Card (lc) ASIC instance 0 is associated with interface Gig1/0/13  
 id 13 asic 0 asicport 12 mac 23 contextid 12 intl\_port\_sup0 9 intl\_port\_sup1 1 maxspeed  
 DEV\_PORT\_SPEED\_1G asic\_subport 4

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

```

| ASIC 1 |
| Core 0 |
| Asic Port 12 |
| (Mac 0) |
| Nif_Rx NifTx |
+-----+

```

SLI MAC 9

```

+-----+
| SLI_Tx SLI_Rx |
+-----+

```

----> Line Card 1. The statistic output below is only for this Line card ASIC

```

| ASIC 0 |
| Asic Port 12 |
| (Mac 23) |
| 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

```

NifTxByteGroupStats:

```

txBytes          6440428
NifTxByteDestinationGroupStats:
txUnicastBytes   1164528
txMulticastBytes 5250491
txBroadcastBytes 25409

```

NifTxFrameDestinationGroupStats:

```

txUnicastFrames  18158
txMulticastFrames 24625
txBroadcastFrames 51
txPauseFrames    0
txCos0PauseFrames 0

```

rxCos1PauseFrames	0	txCos1PauseFrames	0
rxCos2PauseFrames	0	txCos2PauseFrames	0
rxCos3PauseFrames	0	txCos3PauseFrames	0
rxCos4PauseFrames	0	txCos4PauseFrames	0
rxCos5PauseFrames	0	txCos5PauseFrames	0
rxCos6PauseFrames	0	txCos6PauseFrames	0
rxCos7PauseFrames	0	txCos7PauseFrames	0
rxOamProcessedFrames	0	txOamFrames	0
NifRxPortStatusGroupStats:		NifTxPortStatusGroupStats:	
rxCollisionFragments	0	txLateCollisionFrames	0
rxFcsErrorFrames	0	txsystemFcsErrorFrames	0
rxInvalidOversizeFrames	0	txOversizeFrames	0
rxMacOverrunFrames	0	txMacUnderrunFrames	0
rxIpgViolationFrames	0	txDeferredFrames	0
rxOamDroppedFrames	0	txExcessiveDeferralFrames	0
rxSymbolErrorFrames	0	txOkMultipleCollisionFrames	0
rxValidOversizeFrames	0	txOkSingleCollisionFrames	0
rxValidUndersizeFrames	0	goldFramesTruncated	0
NifRxSizeGroupStats:		NifTxSizeGroupStats:	
rx32768toMtuFrames	0	tx32768toMtuFrames	0
rx16384to32767ByteFrames	0	tx16384to32767ByteFrames	0
rx8192to16383ByteFrames	0	tx8192to16383ByteFrames	0
rx4096to8191ByteFrames	0	tx4096to8191ByteFrames	0
rx2048to4095ByteFrames	0	tx2048to4095ByteFrames	0
rx1519to2047ByteFrames	51	tx1519to2047ByteFrames	0
rx1024to1518ByteFrames	15	tx1024to1518ByteFrames	0
rx512to1023ByteFrames	17	tx512to1023ByteFrames	186
rx256to511ByteFrames	3374	tx256to511ByteFrames	9318
rx128to255ByteFrames	6505	tx128to255ByteFrames	6518
rx65to127ByteFrames	11237	tx65to127ByteFrames	8526
rx64ByteFrames	18191	tx64ByteFrames	18286

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

IgrPacketCounters:		EgrPacketCounters:	
packetsIn	97078	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:

**---> Output queue (Agm = Active queue management)**

<b>AqmRedQueueStats:</b>		<b>(sum of all queues)</b>
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:		SliRxByteGroupStats:	
txBytes	4457854	rxBytes	6440428

```
SLI MAC 1 - SUP 1:
SliTxByteGroupStats:          SliRxByteGroupStats:
txBytes                        0          rxBytes                        0
```

Controleer de stroombeheerstatus vanuit een lijnkaartperspectief voor de interface van het voorpaneel. Dit helpt elke congestie op de interface te identificeren.

- Waarden zijn "-" wanneer er geen stroomcontrole is anders wordt het nummer van de wachtrij dat stroommebeheersing ervaart (congestie) aangegeven.
- Flow control dat door de interface wordt ontvangen wordt doorgegeven van de Line Card ASIC op de Line-kaart naar de Supervisor ASIC op de supervisor ASIC waar AQM-druppels doorgaans op de Supervisor ASIC worden gezien. De OCI (Out-of-band Control Interface) is het interne communicatiekanaal tussen de lijnkaart en de actieve supervisor die wordt gebruikt om het stroombeheer van lijnkaart naar supervisor aan te geven.

```
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 vanuit een ASIC-perspectief van de lijnkaartkaart tussen de lijnkaartstap ASIC op de lijnkaart en de supervisor die ASIC op de actieve en standby Supervisors via de OCI-interfaces doorstuurt.

- OCI = out-of-band regelinterface = interne communicatiekanalen tussen de lijnkaart en actieve en standby toezichthouders

```
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 van de lijnkaartstap ASIC op de lijnkaart deelt naar de supervisor die ASIC op de actieve supervisor uitvoert. Elke poortgroep wordt geassocieerd met één van de SLI (System Link Interface) op de lijnkaartstap ASIC naar de supervisor.

```
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	