Convalida dell'hardware di layer 2 sugli switch Catalyst serie 9000

Sommario

[Introduzione](#)
[Prerequisiti](#)
[Requisiti](#)
[Componenti usati](#)
[Premesse](#)
[Terminologia](#)
[Topologia](#)
[Programmazione interfaccia](#)
[Mappatura dell'interfaccia alla variante UADP 2.0](#)
[Esempio di output](#)
[Programmazione interfaccia fisica](#)
[Programmazione Etherchannel](#)
[Configurazione Globale Etherchannel](#)
[Programmazione VLAN](#)
[Spanning Tree Programming](#)
[Programmazione inoltro L2](#)
[Programmazione software](#)
[Programmazione hardware - Metodo 1](#)
[Programmazione macHandle](#)
[Programmazione siHandle](#)
[Programmazione diHandle](#)
[Programmazione hardware - Metodo 2](#)
[Utilizzo TCAM](#)
[Programmazione hardware riuscita](#)
[Controllo dello stato](#)
[Policy e traffico del Control Plane](#)
[Statistiche eventi tabella MAC](#)
[UADP 2.0 Exception Drops](#)
[Statistiche supervisore - Percorso dati da supervisore a scheda di linea](#)
[Statistiche scheda di linea - Percorso dati da supervisore a scheda di linea](#)

Introduzione

In questo documento viene descritto come convalidare la programmazione e l'inoltro hardware di layer 2 sugli switch Catalyst serie 9400.

Prerequisiti

Requisiti

Nessun requisito specifico previsto per questo documento.

Componenti usati

Per la stesura del documento, sono stati usati switch Catalyst serie 9400 (UADP 2.0).

> **Nota**: la versione software utilizzata in questo documento è la 16.6.1, ma deve essere mantenuta per le versioni più recenti di Cisco IOS-XE.

> **Nota**: è possibile usare questo documento per altri tipi di switch Catalyst 9000, ma ignorare i comandi che fanno riferimento a una scheda di linea.

Le informazioni discusse in questo documento fanno riferimento a dispositivi usati in uno specifico ambiente di emulazione. Su tutti i dispositivi menzionati nel documento la configurazione è stata ripristinata ai valori predefiniti. Se la rete è operativa, valutare attentamente eventuali conseguenze derivanti dall'uso dei comandi.

Premesse

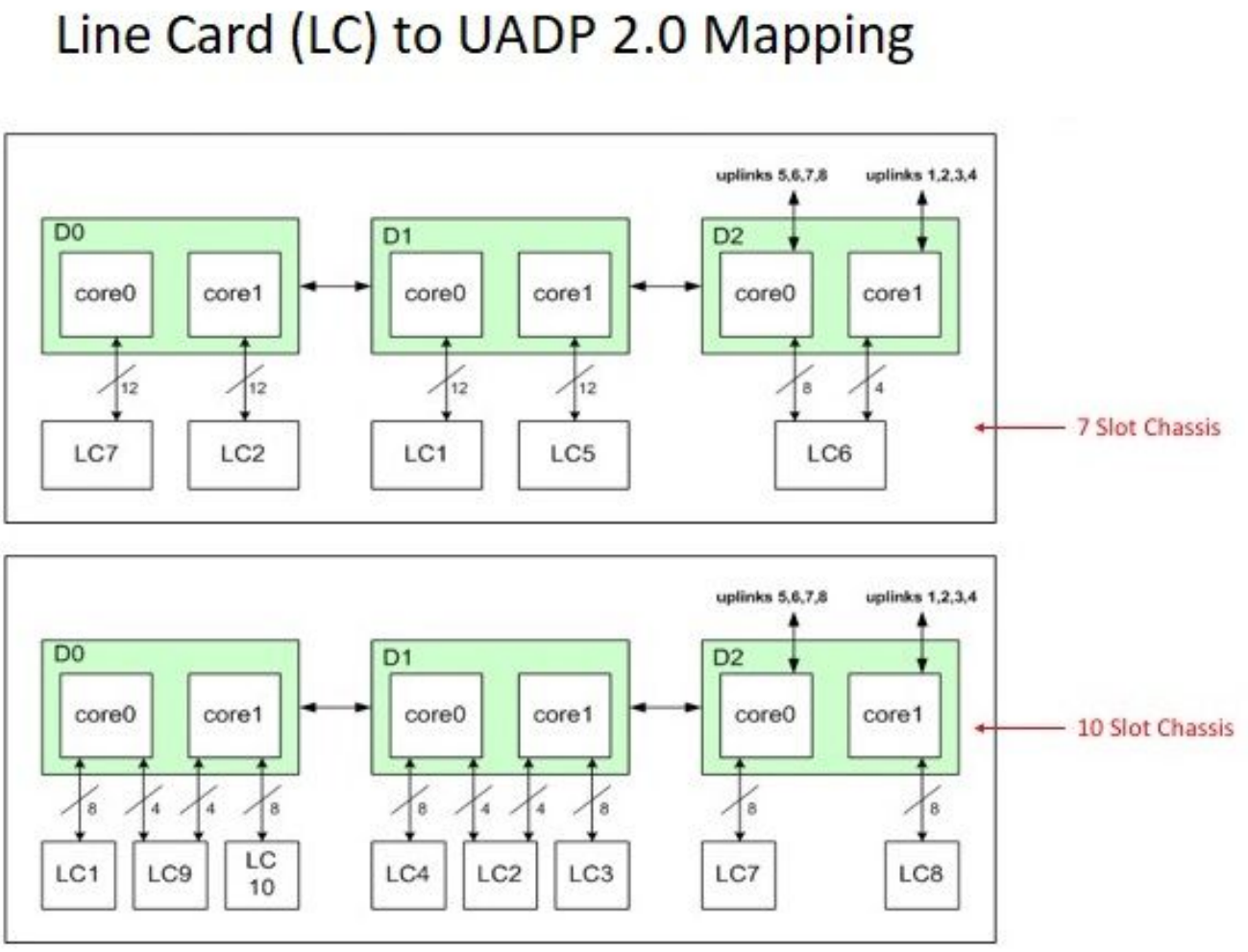
- Catalyst 9400 Supervisor1 (C9400-SUP-1) dispone di 3 ASIC di inoltro UADP 2.0 (0, 1, 2).
- Ogni ASIC di inoltro UADP 2.0 dispone di: Un dual-core (0, 1) - non esisteva nelle precedenti generazioni di ASICS UADP 2.0.SIF (Stack Interfaces) - utilizzato per connettersi agli altri 2 ASIC UADP 2.0 tramite un anello dello stack interno.NIF (Network Interfaces) - utilizzato per collegare una o più schede di linea tramite il backplane.
- Tutte le decisioni di inoltro dei pacchetti per le schede di linea e le interfacce uplink del Supervisor sono prese dai 3 ASIC di inoltro UADP 2.0 sul Supervisor attivo.
- Le schede di linea utilizzate in questo esempio dispongono di un ASIC stub single-core a 1 scheda di linea che non è coinvolto nelle decisioni di inoltro dei pacchetti.
- L'ASIC Line Card stub sulla scheda di linea si collega a 1 o più dei 3 ASIC di inoltro UADP 2.0 sul Supervisor tramite il backplane.
- I 3 ASIC di inoltro UADP 2.0 sul Supervisor prendono tutte le decisioni relative all'inoltro dei pacchetti.

Terminologia

Acronimo	Definizione
RP	Route Processor
FP	Processore di inoltro
FED	Driver motore di inoltro. Processo software che programma l'ASIC di inoltro del Supervisor
Object-manager	Voci MAC del software FP memorizzate come oggetti asincroni nel database degli oggetti.
LSMPI	Interfaccia Punt di memoria condivisa Linux. Trasporto tra il piano dati (hardware-UADP 2. piano di controllo (software-CPU).

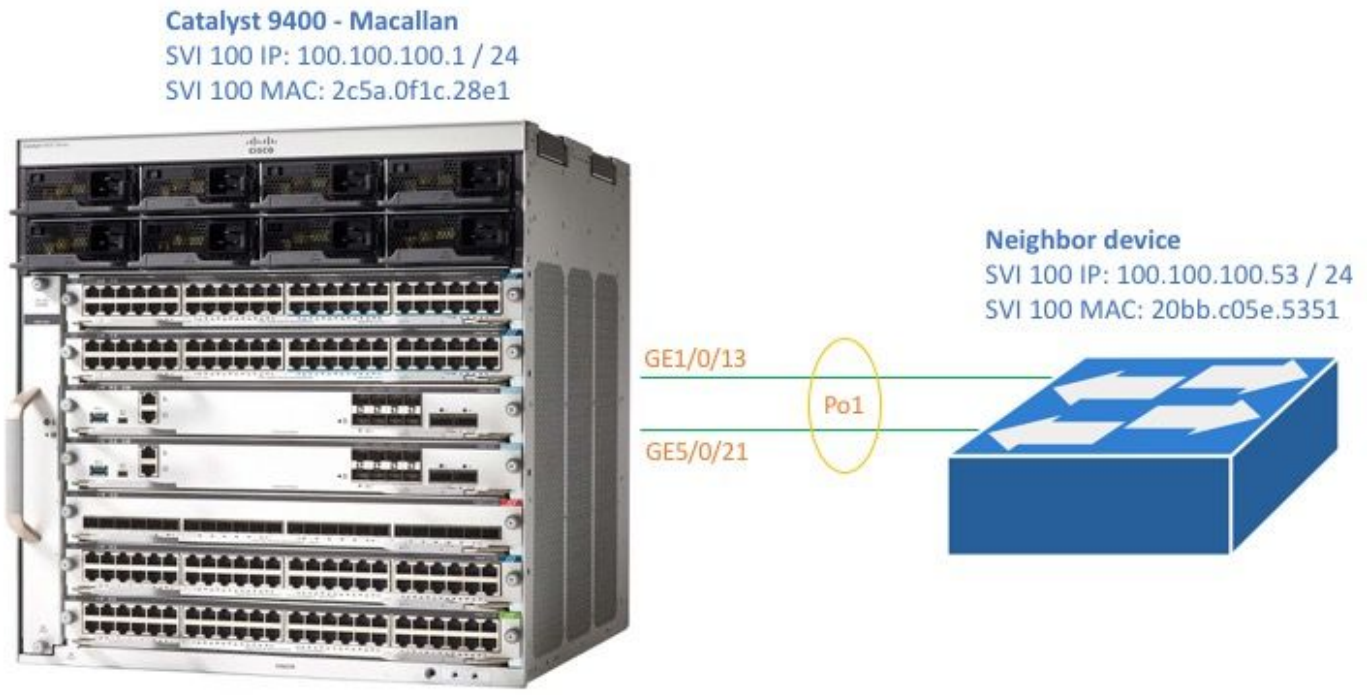
IFM	Elaborazione del software Interface Manager.
IF_ID	IDentifier è un valore univoco che rappresenta un'interfaccia specifica. Viene utilizzato dura la programmazione interna dello switch.
Inst	Istanza. Indica che l'interfaccia Asic/Core di UADP 2.0 è collegata a: 0=Asic0/Core0, 1=Asic0/Core1, 2=Asic1/Core0, 3=Asic1/Core1, 4=Asic2/Core0, 5=Asic2/Core1.
Asic	Specifica a quale UADP 2.0 è associata un'interfaccia: 0=UADP 2.0 #0, 1=UADP 2.0 #1, 2 UADP 2.0 #2.
Core	Specifica a quale core dell'interfaccia UADP 2.0 è associato: 0=nucleo0, 1=nucleo1.
Port	Numero ordinale di variante di una porta all'interno di uno slot. Nello stesso slot tutti i nume porta sono univoci.
SubPort	Identifica una porta all'interno di un gruppo di porte (Cntx) per le porte del pannello anterior sono sotto-porte (Cntx e SubPort identificano insieme una porta univoca sotto-porta).
Mac	Identificatore di interfaccia utilizzato quando un'interfaccia esegue MACsec (autenticazione crittografia di protezione).
Cont.	Contesto. Numero di gruppo a cui appartiene una porta quando l'interfaccia del pannello anteriore è sottoporta (Cntx e SubPort identificano insieme una porta univoca sottoporta).
LPN	Logical Port Number associato a un'interfaccia.
GPN	Numero porta globale associato a un'interfaccia.
Digitare NIF	Interfaccia di rete; NRU = uplink ridondante in rete
SE_È	IDentifier interfaccia. Valore univoco che rappresenta un'interfaccia specifica. Viene utilizza durante varie programmazioni interne allo switch.
Port_LE	Entità logica porta. Questa è la configurazione dell'interfaccia.
AOM	Gestione oggetti asincroni. Le informazioni dei programmi FP nel database degli oggetti co oggetto.
VP	Virtual Port
MATM	Gestione tabella indirizzi MAC
RP	Route Processor
OM_PTR	Puntatore di Object Manager
ID_tabella	Identificatore tabella = vlan
CMAN	Gestione chassis
FP	Processore di inoltro
porta_fp	Le porte del pannello anteriore.
Sif	Interfaccia stack (verso gli altri 2 ASIC di inoltro UADP 2.0 sul Supervisor).
Nif	Interfaccia di rete (verso l'interfaccia del pannello anteriore)
IGR/EGR	In ingresso/in uscita
IQS	Utilità di pianificazione code in ingresso
SQS	Programmazione code stack
PBC	Complesso buffer di pacchetto
AQM	Gestione attiva delle code. Questa operazione esegue i controlli di gestione della congesti
AQMR	Active Queue Management: rilevamento casuale anticipato.
EQC	Controller coda in uscita
ESM	Gestione Utilità di pianificazione in uscita
RWE	Riscrivi motore. Aggiunge o elimina le informazioni dell'intestazione dal pacchetto.

IOMD	Driver modulo Input Output
porta_fp	Porta del pannello anteriore.
Nif	Interfaccia di rete (verso l'interfaccia del pannello anteriore)
SLI	Interfaccia System Link (verso il Supervisor)
IGR / EGR = IGR	In ingresso/in uscita
AQMR	Active Queue Management: rilevamento casuale anticipato.
OCI	Interfaccia di controllo fuori banda = canale di comunicazione interno tra la scheda di linea Supervisor attivo
MATM	Gestione tabella indirizzi MAC
Conteggio spostamenti MAC	Questo è il conteggio relativo allo spostamento (apprendimento) di un indirizzo MAC su un nuova interfaccia. Il conteggio degli spostamenti può avvenire quando un host terminale vi spostato fisicamente da un'interfaccia a un'altra, quando un host wireless esegue il roamin un punto di accesso a un altro punto di accesso connesso a un'interfaccia diversa o quand percorso dello spanning-tree cambia o si verifica un loop.



Scheda di linea per UADP

Topologia




```
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)
```

Nota: I comandi show platform possono richiedere che il comando service internal global configuration sia incluso nell'istruzione.

Programmazione interfaccia

Mappatura dell'interfaccia alla variante UADP 2.0

Il comando interface programming visualizza la mappatura dell'interfaccia del pannello anteriore per tutte le schede di linea su uno dei 3 ASIC di inoltro UADP 2.0 sul Supervisor attivo.

Esempio di output

L'esempio mostra che:

- L'interfaccia Gig1/0/3 è collegata a: UADP 2.0 istanza 2 (UADP 2.0 Asic 1, Core 0) sul Supervisor.
- L'interfaccia Gig5/0/21 è collegata a: UADP 2.0 istanza 3 (UADP 2.0 Asic 1, Core 1) sul 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 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--
```

Programmazione interfaccia fisica

Il comando show platform visualizza i dettagli di configurazione software per Gig1/0/3 in base al valore IF_ID dell'esempio di comando precedente.

```
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
```

Questo comando visualizza i dettagli della configurazione hardware per Gig1/0/3 in base al valore PORT_LE del comando precedente.

Valore	Definizione
Valore 0	Valore non impostato.
Valore 1	Il valore impostato nella maggior parte dei casi.

```
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/l3u_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--
```

Programmazione Etherchannel

In questi output di esempio di programmazione Etherchannel, i programmi RP sono FP, i programmi FP sono FED, il FED, quindi i programmi sono l'hardware ASIC di inoltro Supervisor. Le voci software RP sono memorizzate come oggetti nel database degli oggetti e le voci software FP sono memorizzate come oggetti asincroni nel database degli oggetti.

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

Group Mask è diverso da zero in questo output. Viene usato nel processo di hash per determinare il collegamento in etherchannel in cui il flusso di traffico aumenta.

```
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—

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
```

Questo comando mostra la configurazione per il canale porta 1:

```
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 ---> 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
```

Questo comando mostra la configurazione per il mapping delle interfacce.

Acronimo/Istanza	Definizione
IFM	Interface Manager
Istanza	Gig1/0/13 si trova sull'istanza ASIC 2 (UADP 2.0 ASIC 1, core 0) con ID interfaccia 0x13
Istanza	Gig5/0/21 si trova sull'istanza ASIC 3 (UADP 2.0 ASIC 1, core 1) con ID interfaccia 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 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--
```

Configurazione Globale Etherchannel

```
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
```

Programmazione VLAN

```
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
```

Con questo comando vengono visualizzati i dettagli delle impostazioni di configurazione hardware per la VLAN 100.

Valore	Definizione
Valore 0	Valore non impostato.
Valore 1	Il valore impostato nella maggior parte dei casi.

```
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

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 Programming

```
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)

C9400#show etherchannel summary
```

```
--snip--

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

Questi comandi visualizzano lo stato di inoltro dello Spanning Tree per 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
—snip—
Port-channel1                     748                0
—snip—
```

```
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
```

I comandi seguenti visualizzano lo stato di inoltro hardware dello spanning tree per la VLAN 100.

```
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--
```

```
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)
```

Verificare la stabilità dello spanning-tree. Assicurarsi che le notifiche di modifica della topologia (TCN) non vengano visualizzate di frequente.

```
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--
```

Programmazione inoltro L2

```
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
```

Programmazione software

Nei successivi esempi di output, i programmi RP, i programmi FP, i FED e infine i programmi ASIC di inoltro del Supervisor. Le voci MAC del software RP sono memorizzate come oggetti nel database degli oggetti e le voci MAC del software FP sono memorizzate come oggetti asincroni nel database degli oggetti.

```
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
```

Programmazione hardware - Metodo 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_MSRP_ADDR        0x400000  MAT_LISP_LOCAL_ADDR   0x800000
MAT_LISP_REMOTE_ADDR 0x1000000 MAT_VPLS_ADDR         0x2000000
```

Programmazione macHandle

Acronimo/Termine	Definizione
vlan:10	MVID 10. La VLAN 100 utilizza internamente l'ID VLAN mappato (MVID) 10 nello switch.
gpn:1104	Numero globale di porte del canale porta 1.
mac:0x20bbc	Indirizzo MAC 20bb.c05e.5351

05e5351

Questo è un esempio di output di programmazione macHandle:

```
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
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-channel1    0x000002ec
--snip--

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--
```

Nota: L'interfaccia su cui il mac ha appreso era un'interfaccia singola invece che una porta-canale. Questo comando è usato per determinare il mapping tra GPN e interfaccia

```
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--
```

Programmazione siHandle

Acronimo/Termine	Definizione
impugnatura	Handle indice stazione. Le informazioni di riscrittura del pacchetto (RI = Rewrite Index) e le informazioni dell'interfaccia in uscita (DI = Destination Index).

Bitmap della replica per dual-core su singolo Supervisor ASIC:

Acronimo/Termine	Definizione
ASIC locale (LD = dati locali)	Destinazione sullo stesso A stesso core dell'origine.
Core copy (CD = Core Data	Destinazione sullo stesso A un altro core.
ASIC remoto (RD = Remote Data)	Destinazione su un altro A

```
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 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

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)**
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--

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)
```

Non sono previste informazioni di riscrittura MAC poiché si tratta di una voce di inoltro MAC di layer 2.

```
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
```

Programmazione diHandle

Acronimo	Definizione
diHandle	Handle dell'indice di destinazione. Informazioni sull'interfaccia in uscita.

```
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)
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--

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)
```

Programmazione hardware - Metodo 2

Acronimo/Termine	Definizione
vlan:10	MVID 10. La VLAN 100 utilizza internamente l'ID VLAN mappato (MVID) 10 nello switch.
gpn:1104	Numero globale di porte del canale porta 1.
mac:0x20bbc05e5351	Indirizzo MAC 20bb.c05e.5351

Output esempio metodo di programmazione hardware 2:

```
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-channel1    0x000002ec
--snip--

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--
```

Nota: Se l'interfaccia su cui il mac ha appreso era una singola interfaccia invece che una porta-canale, il comando successivo viene usato per determinare il mapping tra gpn e interfaccia:

```
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--
```

Utilizzo TCAM

Controllare l'utilizzo TCAM per le voci dell'indirizzo MAC su ciascuna istanza di Supervisor ASIC per verificare che lo switch non esaurisca lo spazio TCAM per memorizzare le voci nell'hardware.

```
C9400show 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--
```

Programmazione hardware riuscita

Tutte le funzioni (indirizzo MAC, interfaccia, vlan e così via) vengono memorizzate nel database degli oggetti e programmate nell'hardware come oggetti.

L'RP programma l'FP, i programmi FP l'FED e infine il FED programma l'hardware ASIC di inoltro del Supervisor. Le voci software RP sono memorizzate come oggetti nel database degli oggetti, mentre le voci software FP sono memorizzate come oggetti asincroni nel database degli oggetti.

Quando il FP programma il FED (che a sua volta programma il Supervisor forwarding ASIC), il FED invia una conferma al FP. L'FP quindi lo inoltra all'RP per indicare che la programmazione hardware è stata completata correttamente. Se la programmazione dell'hardware FED è mancante o errata, è possibile utilizzare questo comando per verificare la presenza di problemi e/o riconoscimenti.

```
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
```

Se il comando precedente mostra oggetti diversi da zero in stato di problema in sospeso, utilizzare questo comando per trovare il numero di oggetto interessato:

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

Utilizzare quindi questo comando per determinare il processo bloccato associato al numero dell'oggetto:

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

Sul lato RP, utilizzare questo comando per verificare la presenza di un oggetto in sospeso (In attesa di eliminazione) non riconosciuto dal FP.

```
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--
```

Controllo dello stato

Policy e traffico del Control Plane

Verificare che non vi siano cadute di CoPP (Control Plane Policy) in hardware-UADP 2.0 per il traffico puntato alla CPU software. Questo può avere un impatto sull'apprendimento MAC e sulla stabilità dello Spanning Tree.

```
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
```

Di seguito è riportato lo stesso output CoPP dell'esempio precedente in un formato più granulare e più semplice da leggere (compresso).

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

                        CPU Queue Statistics
============================================================================================
                                                 (default) (set)     Queue         Queue
QId PlcIdx  Queue Name                Enabled    Rate      Rate      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    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 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/
```

Controllare le statistiche del percorso punt della CPU (hardware-UADP 2.0 Towards software-CPU) dal punto di vista del software (CPU).

```
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

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



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

Controllare le statistiche del percorso di inserimento della CPU (software-CPU verso l'hardware-Supervisor) dal punto di vista del software (CPU).

```
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
```

Controllare le statistiche del percorso di inserimento/punt della CPU da una prospettiva FED (UADP 2.0).

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

Controllare le statistiche del percorso punt della CPU (hardware-supervisor verso il software-CPU) dal punto di vista FED (supervisore).

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

Controllare lo stato delle 31 code di punt delle singole CPU da una prospettiva FED (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–
```

Controllare le statistiche del percorso di inserimento della CPU (software-CPU verso l'hardware-Supervisor) dal punto di vista di FED (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
-------------------------------------------------------------------------------
```

Controllare lo stato delle 2 singole code di inserimento CPU da una prospettiva FED (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
```

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

Statistiche eventi tabella MAC

```
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 Exception Drops

Questo comando descrive in dettaglio i motivi per cui un ASIC di inoltro UADP 2.0 scarta un pacchetto:

```
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--
```

Statistiche supervisore - Percorso dati da supervisore a scheda di linea

Controllare le statistiche ASIC di inoltro di Supervisor UADP 2.0 attive associate a un'interfaccia del pannello anteriore specifica. nell'esempio viene usata l'interfaccia Gig1/0/13.

Esempio di output:

- Verificare quali interfacce della scheda di linea fanno parte dello stesso gruppo di porte.
- Ogni gruppo di porte ha condiviso 8 Gb/s di larghezza di banda dall'ASIC di stub della scheda di linea all'ASIC di inoltro del Supervisor.
- Ciascun gruppo di porte è associato a una SLI (System Link Interface) sull'ASIC dello stub della scheda di linea verso l'ASIC di inoltro del Supervisor.

```
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 |
    |              |
    |   (Mac  0)   |
    |Nif_Rx   NifTx|
    +--------------+
        ^       |
        |       |
        |       |
        |       V

============================================
Nif MAC 0 Inforation:
NifRxByteGroupStats:                          NifTxByteGroupStats:
 rxBytes                    4495494            txBytes                    6499427
NifRxByteDestinationGroupStats:               NifTxByteDestinationGroupStats:
 rxUnicastBytes             1174628            txUnicastBytes             1175536
 rxMulticastBytes           3320866            txMulticastBytes           5298482
 rxBroadcastBytes           0                  txBroadcastBytes           25409
NifRxPortStatusGroupStats:                    NifTxFrameDestinationGroupStats:
 rxUnicastFrames            18326              txUnicastFrames            18330
 rxMulticastFrames          21387              txMulticastFrames          24834
 rxBroadcastFrames          0                  txBroadcastFrames          51
 rxPauseFrames              0                  txPauseFrames              0
 rxCos0PauseFrames          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      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:
                                               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
```

Controllare lo stato del controllo del flusso dalla prospettiva di un Supervisor per l'interfaccia del pannello anteriore. Questo comando permette di identificare eventuali congestioni sull'interfaccia.

```
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
```

Verificare che il traffico di controllo scorra dalla prospettiva di un ASIC di inoltro Supervisor tra l'ASIC di inoltro Supervisor sul Supervisor attivo e l'ASIC dello stub della scheda di linea sulla scheda di linea tramite le interfacce OCI.

```
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
```

Statistiche scheda di linea - Percorso dati da supervisore a scheda di linea

Controllare le statistiche ASIC Line card stub Card associate a un'interfaccia del pannello anteriore specifica. Nell'esempio, l'interfaccia Gig1/0/13 è l'elemento attivo.

Esempio di output:

- Pacchetti ricevuti da Gig 1/0/13, accedere alla porta di ricezione dell'interfaccia di rete e passare attraverso IQS all'interfaccia dello stack.
- Da qui, un pacchetto può uscire dall'interfaccia dello stack per un altro Supervisor ASIC o tornare indietro attraverso SQS, AQM, EQC, ESM, RWE, e quindi uscire dalla trasmissione dell'interfaccia di rete di Gig 1/0/13.
- I pacchetti inviati da altre interfacce ASIC Supervisor che escono da Gig 1/0/13 entrano in Sif

e quindi passano attraverso SQS, AQM, EQC, ESM, RWE e quindi escono da NifTx di Gig 1/0/13.

- Per AQM ci sono 8 code Tx. Se vengono visualizzate le eliminazioni da queste code, è possibile utilizzare questo comando per determinare quale delle code sta riscontrando le eliminazioni: show platform hardware feed active va in coda statistiche interfaccia 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:                          NifTxByteGroupStats:
 rxBytes                    4457854            txBytes                    6440428
NifRxByteDestinationGroupStats:               NifTxByteDestinationGroupStats:
 rxUnicastBytes             1163684            txUnicastBytes             1164528
 rxMulticastBytes           3294170            txMulticastBytes           5250491
 rxBroadcastBytes           0                  txBroadcastBytes           25409
NifRxPortStatusGroupStats:                    NifTxFrameDestinationGroupStats:
 rxUnicastFrames            18155              txUnicastFrames            18158
 rxMulticastFrames          21235              txMulticastFrames          24625
 rxBroadcastFrames          0                  txBroadcastFrames          51
 rxPauseFrames              0                  txPauseFrames              0
 rxCos0PauseFrames          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:
                                                AqmRedQueueStats:          (sum of all queues)
--> Output queue (Agm = 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:                            SliRxByteGroupStats:
 txBytes                    4457854              rxBytes                    6440428

SLI MAC 1 - SUP 1:
SliTxByteGroupStats:                            SliRxByteGroupStats:
```

```
 txBytes                    0                        rxBytes                    0
```

Controllare lo stato del controllo del flusso dalla prospettiva di una scheda di linea per l'interfaccia del pannello anteriore. Ciò aiuta a identificare eventuali congestioni sull'interfaccia.

- I valori sono "-" quando non è presente alcun controllo del flusso; in caso contrario, è indicato il numero della coda che ha sperimentato il controllo del flusso (congestione).
- Il controllo del flusso ricevuto dall'interfaccia viene passato dall'ASIC scheda linea sulla scheda di linea all'ASIC Supervisor sul Supervisor, dove le perdite AQM vengono in genere visualizzate sull'ASIC Supervisor. L'OCI (Out-of-band Control Interface) è il canale di comunicazione interno tra la scheda di linea e il Supervisor attivo utilizzato per segnalare il controllo del flusso dalla scheda di linea al Supervisor.

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

Verificare che il traffico di controllo scorra da una prospettiva ASIC Line Card Stub tra l'ASIC Line Card Stub sulla scheda Line e l'ASIC Supervisor forwarding sui supervisori attivi e in standby tramite le interfacce OCI.

- OCI = Out-of-band Control Interface = canali di comunicazione interni tra la scheda di linea e i supervisori attivi e in standby

```
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
```

Verificare quali interfacce della scheda di linea fanno parte dello stesso gruppo di porte che condivide 8 Gb/s di larghezza di banda dall'ASIC dello stub della scheda di linea verso l'ASIC di inoltro del Supervisor attivo. Ciascun gruppo di porte è associato a una della SLI (System Link Interface) sull'ASIC dello stub della scheda di linea verso il 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	