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

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Introduzione

Questo documento descrive 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 rimane applicabile alle versioni più recenti di Cisco IOS®.

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.

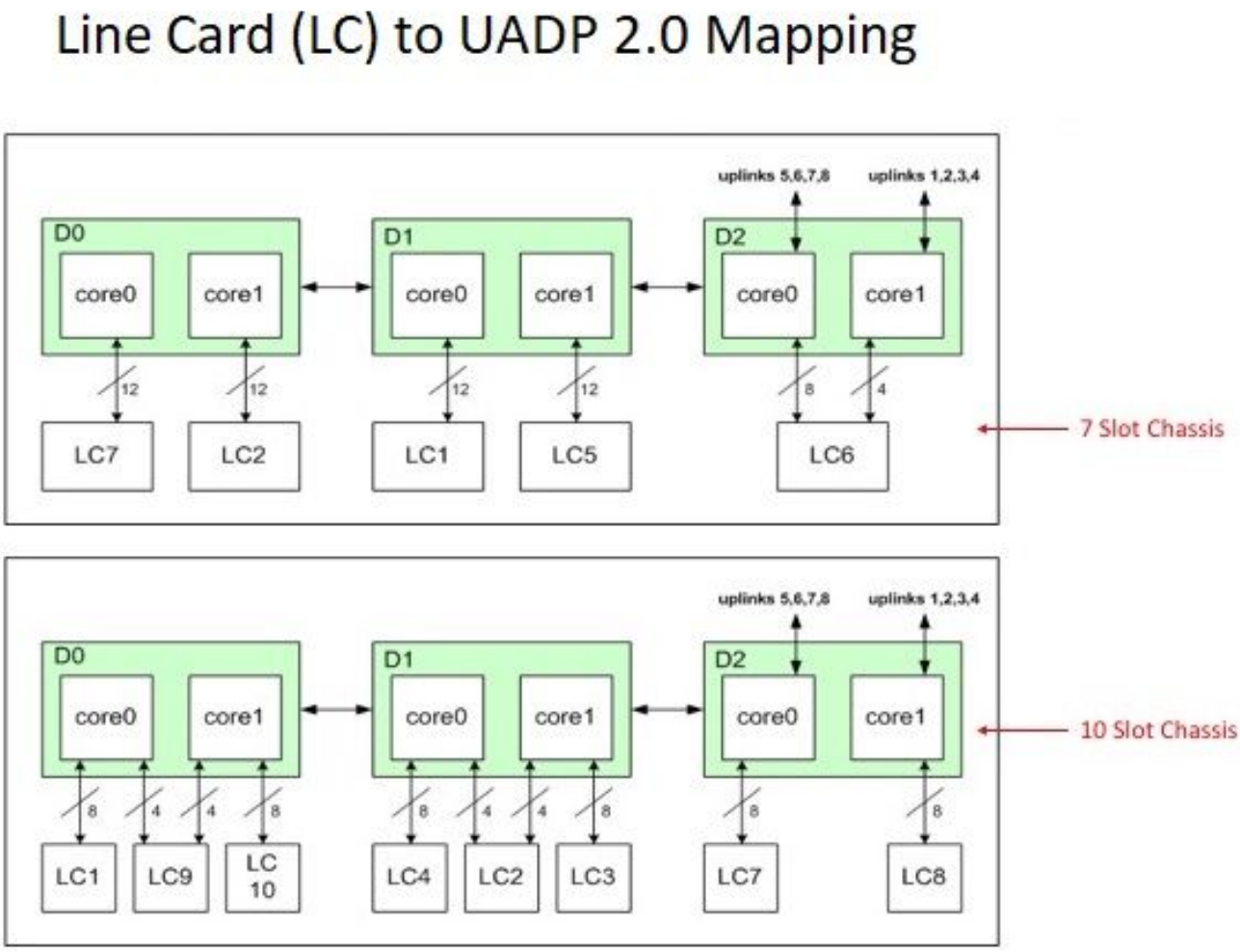
Terminologia

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 2.0) e il 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 durante 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.
Nucleo	Specifica il core associato all'interfaccia UADP 2.0: 0=core0, 1=core1.
Port	Numero ordinale di variante di una porta all'interno di uno slot. Nello stesso slot tutti i numeri di porta sono univoci.
SubPort	Identifica una porta all'interno di un gruppo di porte (Cntx) per le porte del pannello anteriore che sono sotto-porte (Cntx e SubPort identificano insieme una porta univoca sotto-porta).
Mac	Identificatore di interfaccia utilizzato quando un'interfaccia esegue MACsec (autenticazione e 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 = Ridondanza di rete Uplink
SE_È	IDentifier interfaccia. Valore univoco che rappresenta un'interfaccia specifica. Viene utilizzato 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 sotto forma di 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).

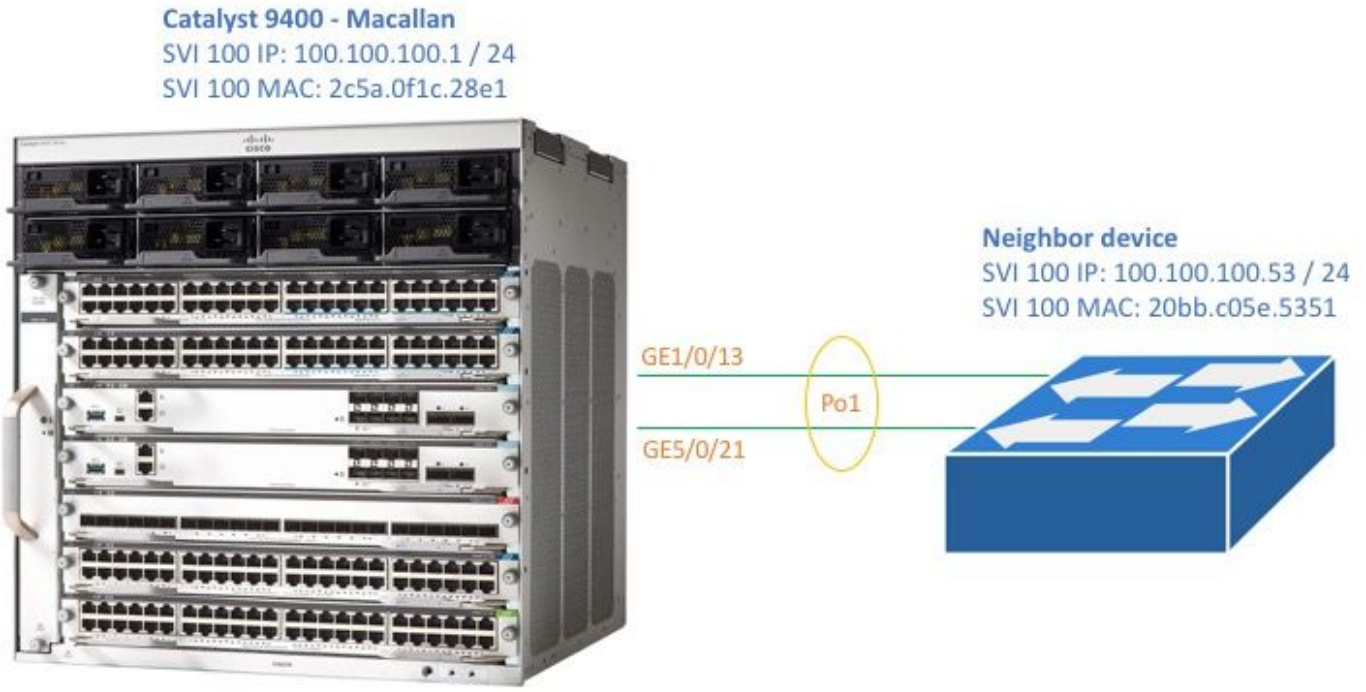
Nif	Interfaccia di rete (verso l'interfaccia del pannello anteriore)
IGR/EGR	In ingresso/in uscita
IQS	Utilità di pianificazione code in ingresso
SQS	Programmazione code stack
PBC	Complesso buffer di pacchetto
AQM	Gestione attiva delle code. Questa operazione esegue i controlli di gestione della congestione.
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 informazioni di intestazione dal pacchetto.
IOMD	Driver del modulo di input/output
porta_fp	La 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 e il Supervisor attivo

MATM	Gestione tabella indirizzi MAC
Conteggio spostamenti MAC	Questo è il conteggio relativo allo spostamento (apprendimento) di un indirizzo MAC su una nuova interfaccia. Il conteggio degli spostamenti può avvenire quando un host terminale viene spostato fisicamente da un'interfaccia a un'altra, quando un host wireless esegue il roaming da un punto di accesso a un altro punto di accesso connesso a un'interfaccia diversa o quando il percorso dello spanning-tree cambia o si verifica un loop.



Scheda di linea per UADP

Topologia



<#root>

C9400#

show version

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

<#root>

C9400#

show module

```
Chassis Type: C9407R

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

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

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

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

<#root>

C9400#

show running-config interface port-channel 1

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

<#root>

C9400#

show running-config interface gigabitEthernet 1/0/13

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

<#root>

C9400#

show running-config interface gigabitEthernet 5/0/21

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

<#root>

C9400#

show etherchannel summary

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

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.

<#root>

C9400#

show platform software fed active ifm mappings

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

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.

<#root>

C9400#

show platform software fed active ifm if-id 0x13

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

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

      Port Information
      Handle ............ [0x72000285]
      Type .............. [Layer2]
      Identifier ........ [0x13]
      Slot .............. [1]
      Unit .............. [13]
      Port Physical Subblock
           Affinity .......... [local]
           Asic Instance ..... [2 (A:1,C:0)]
           AsicPort .......... [12]
           AsicSubPort ....... [4]
           MacNum ............ [0]
           ContextId ......... [0]
           LPN ............... [13]
           GPN ............... [113]
           Speed ............. [1GB]
           type .............. [NIF]
           PORT_LE ........... [0x7fe5c5aabc28]
           L3IF_LE ........... [0x0]
           EC GPN ............ [1105]
           EC L3IF_LE ........ [0x0]
           EC Port Mask ...... [0xaaaaaaaaaaaaaaaa]
           DI ................ [0x7fe5c5ab5c48]
      Port L2 Subblock
           Enabled ............. [Yes]


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

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

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

Con questo comando vengono visualizzati 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.

<#root>

C9400#

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

```
Handle:0x7fe5c5aabc28 Res-Type:ASIC_RSC_PORT_LE Res-Switch-Num:0 Asic-Num:2 Feature-ID:AL_FID_IFM Lkp-f
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index2:0xc mtu_index/l3u_ri_index2:0x4 sm handle

Detailed Resource Information (ASIC#2)
---------------------------------------

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

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

Programmazione Etherchannel

In questi output di esempio di programmazione Etherchannel, i programmi RP, i programmi FP, i programmi FED, i programmi FED, quindi i programmi dell'hardware ASIC di inoltro 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.

<#root>

```
C9400#
```

show etherchannel summary

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

Group Mask 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.

<#root>

```
C9400#
```

show platform software interface rp active brief

```
Forwarding Manager Interfaces Information

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

```
-snip-
```

<#root>

```
C9400#
```

show platform software fed active etherchannel 1 group-mask

```
Group Mask Info
Aggport IIF Id: 00000000000002EC ---> hex 0x2EC = dec 748
Active Port: : 2 ------------------> 2 active interfaces in the etherchannel = the Member ports below

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

Questo comando mostra la configurazione per il canale porta 1:

<#root>

```
C9400#
```

show platform software fed active ifm if-id 0x000002ec

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

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

```
Index[3] : 00000000000000
```

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

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

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

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

DiBcam handle on asic [2].... [0x7fe5c6ae3608]

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

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

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 è su istanza ASIC 3 (UADP 2.0 ASIC 1, core 1) con ID interfaccia 0x8f

<#root>

C9400#

show platform software fed active ifm mappings

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

Configurazione Globale Etherchannel

<#root>

C9400#

show platform software ether-channel rp active global-config

```
Forwarding Manager EtherChannel Global Configuration Information

  Frame Dist Method:
```

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

<#root>

C9400#

show platform software ether-channel fp active global-config

```
Forwarding Manager EtherChannel Global Configuration Information

  Frame Dist Method: Dest-IP-Address
             AOM ID: 27
             Status:
```

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

<#root>

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

<#root>

```
C9400#

show platform software fed active vlan 100

VLAN Fed Information

Vlan Id IF Id              LE Handle          STP Handle      L3 IF Handle          SVI IF ID          I
-------------------------------------------------------------------------------------------------------
100     0x0000000000420011 0x00007fe5c4616ef8 0x00007fe5c4617778 0x00007fe5c50dac28 0x00000000000002ea 1
```

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.

<#root>

```
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 Lk
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index0:0xa mtu_index/l3u_ri_index0:0x0 sm handle
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 0

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

<#root>

```
C9400#
```

show spanning-tree vlan 100

```
VLAN0100

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

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

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

<#root>

```
C9400#
```

show etherchannel summary

```
--snip--

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

Questi comandi visualizzano lo stato di inoltro dello Spanning Tree per Port-channel 1.

<#root>

```
C9400#
```

show platform software interface rp active brief

```
Forwarding Manager Interfaces Information

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

<#root>

C9400#

show platform software fed active vp summary interface if_id 748

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

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

<#root>

C9400#

show platform software fed active vp summary vlan 100

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

<#root>

C9400#

show platform hardware fed active vlan 100 ingress

```
VLAN STP State in hardware

vlan id is:: 100
Interfaces in forwarding state: : Gi2/0/11(Tagged), Gi1/0/1(Tagged), Gi1/0/13(Tagged), Gi5/0/21(Tagged)
flood list: : Gi2/0/11, Gi1/0/1, Gi1/0/13, Gi5/0/21
```

<#root>

C9400#

show platform hardware fed active vlan 100 egress

VLAN STP State in hardware

vlan id is:: 100
Interfaces in forwarding state: : Gi2/0/11(Tagged), Gi1/0/1(Tagged), Gi1/0/13(Tagged), Gi5/0/21(Tagged)

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

<#root>

C9400#

show spanning-tree vlan 100 detail

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

--snip--
```

Programmazione inoltro L2

<#root>

C9400#

show etherchannel summary

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

<#root>

C9400#

```
ping 100.100.900.53

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

<#root>

```
C9400#

show mac address-table dynamic vlan 100

Mac Address Table
-------------------------------------------

Vlan Mac Address     Type     Ports
---- -----------     -------- -----
100  0000.0200.0800  DYNAMIC  Gi1/0/1
100  20bb.c05e.5318  DYNAMIC  Po1
100  20bb.c05e.5351  DYNAMIC  Po1
Total Mac Addresses for this criterion: 3
```

Programmazione software

Nei successivi esempi di output, l'RP programma l'FP, i programmi FP l'FED, l'FED infine programma l'hardware ASIC di inoltro Supervisor. Le voci softwareMAC RP vengono memorizzate come oggetti nel database degli oggetti, mentre le voci softwareMAC FP vengono memorizzate come oggetti asincroni nel database degli oggetti.

<#root>

```
C9400#

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

Tbl_Type   Tbl_ID    MAC_Address  Type   Ports  AOM_ID/OM_PTR
MAT_VLAN      100 20bb.c05e.5351     1     1  OM: 0x3700860010
List of Ports: 748
```

<#root>

```
C9400#

show platform software interface rp active brief


Forwarding Manager Interfaces Information

Name                               ID              QFP ID
-----------------------------------------------------------
Null0                              1                 0
GigabitEthernet1/0/1               7                 0
```

```
GigabitEthernet1/0/2              8                 0
GigabitEthernet1/0/3              9                 0
–snip–
Port-channel1                   748                 0
–snip–
```

<#root>

C9400#

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

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

<#root>

C9400#

show platform software object-manager fp active object 6567

```
Object identifier: 6567
  Description: matm mac entry type VLAN, id 100, 20bb.c05e.5351
Status: Done, Epoch: 0, Client data: 0x799633f8
```

Programmazione hardware - Metodo 1

<#root>

C9400#

show platform softwarefed active matm macTable vlan 100

```
VLAN MAC
```

Type

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

0X1

```
    589  0x7fe5c6b03d68 0x7fe5c6865f78 0x7fe51001b458 300      1        Port-channel1
100  0000.0200.0800 0X1    610  0x7fe5c6b07888 0x7fe5c6b076e8 0x7fe5c5972ce8 300      1        GigabitE
Total Mac number of addresses:: 3
*a_time=aging_time(secs) *e_time=total_elapsed_time(secs)
```

Type:

```
MAT_DYNAMIC_ADDR     0x1

       MAT_STATIC_ADDR

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

MAT_CPU_ADDR          0x4       MAT_DISCARD_ADDR      0x8
MAT_ALL_VLANS         0x10      MAT_NO_FORWARD        0x20
MAT_IPMULT_ADDR       0x40      MAT_RESYNC            0x80
MAT_DO_NOT_AGE        0x100     MAT_SECURE_ADDR       0x200
MAT_NO_PORT           0x400     MAT_DROP_ADDR         0x800
MAT_DUP_ADDR          0x1000    MAT_NULL_DESTINATION  0x2000
MAT_DOT1X_ADDR        0x4000    MAT_ROUTER_ADDR       0x8000
MAT_WIRELESS_ADDR     0x10000   MAT_SECURE_CFG_ADDR   0x20000
MAT_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:0x20bbc05e5351	Indirizzo MAC 20bb.c05e.5351

Questo è un esempio di output di programmazione macHandle:

<#root>

```
C9400#

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

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

Detailed Resource Information (ASIC#0)
---------------------------------------
Number of HTM Entries: 1

Entry 0: (handle 0x7fe5c6aed898)

Abs_hash_index: 294
KEY - vlan:10 mac:0x20bbc05e5351 l3_if:0 gpn:1104 epoch:0 static:0 flood_en: 0 vlan_lead_wless_flood_en
```

```
MASK - vlan:0 mac:0x0 l3_if:0 gpn:0 epoch:0 static:0 flood_en:0 vlan_lead_wless_flood_en: 0 client_home_
SRC_AD - need_to_learn:0 lrn_v:0 catchall:0 static_mac:0 chain_ptr_v:0 chain_ptr: 0 static_entry_v:0 au
DST_AD - si:0xcd bridge:0 replicate:0 blk_fwd_o:0 v4_rmac:0 v6_rmac:0 catchall:0 ign_src_lrn:0 port_mas

Detailed Resource Information (ASIC#1)
--snip--
Detailed Resource Information (ASIC#2)
--snip--
```

<#root>

```
C9400#
```

show platform software fed active vlan 100

```
VLAN Fed Information

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

<#root>

```
C9400#
```

show platform software fed active ifm mappings etherchannel

```
Mappings Table

Chan    Interface        IF_ID
-----------------------------------------------------
1       Port-channel1
```

0x000002ec

```
--snip--
```

<#root>

```
C9400#
```

show platform software fed active ifm if-id 0x000002ec <-- IF_ID from previous output

```
Interface IF_ID : 0x00000000000002ec
Interface Name : Port-channel1
Interface Block Pointer : 0x7fe5c685df98
Interface State : READY
Interface Status : ADD, UPD
Interface Ref-Cnt : 5
Interface Type : ETHERCHANNEL
Port Type : SWITCH PORT
Channel Number : 1
SNMP IF Index : 720
Port Handle : 0x50002f6
#Of Active Ports : 2
Base GPN : 1104
Index[2] : 0000000000000013
```

```
Index[3] : 000000000000008f

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

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

<#root>

```
C9400#

show platform software fed active ifm mappings gpn

Mappings Table


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

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/Durata	Definizione
	ASIC locale (LD = dati	Destinazione sullo stesso ASIC, stesso core dell'origine.

	locali)	
	Core copy (CD = Core Data)	Destinazione sullo stesso ASIC, un altro core.
	ASIC remoto (RD = Remote Data)	Destinazione su un altro ASIC.

<#root>

```
C9400#

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

Handle:0x7fe5c6865f78 Res-Type:ASIC_RSC_SI Res-Switch-Num:255 Asic-Num:255 Feature-ID:AL_FID_L3_UNICAST_
priv_ri/priv_si Handle: 0x7fe5c6864938Hardware Indices/Handles: index0:0xcd mtu_index/l3u_ri_index0:0x0
Features sharing this resource:64 (1)]
55 (1)]
Cookie length: 56
00 00 00 00 00 00 00 00 64 00 00 00 00 00 00 00 00 00 00 00 07 00 20 bb c0 5e 53 51 00 00 00 00 00 00 0

Detailed Resource Information (ASIC#0)

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

----------------------------------------

Station Index (SI) [0xcd]

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



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

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

Detailed Resource Information (ASIC#1)

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

--snip--
Detailed Resource Information (ASIC#2)

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

--snip--
Detailed Resource Information (ASIC#3)

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

--snip--
Detailed Resource Information (ASIC#4)
```

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

--snip--
Detailed Resource Information (ASIC#5)

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

--snip--

<#root>

C9400#

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

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

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

Destination Index (DI) [0x51c2]
portMap =

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

cmi1 = 0

(read right to left, zero based)

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

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

Destination Index (DI) [0x51c2]
portMap =

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

cmi1 = 0

(read right to left, zero based)

rcpPortMap = 0
CPU Map Index (CMI) [0]
ctiLo0 = 0
ctiLo1 = 0
ctiLo2 = 0
cpuQNum0 = 0
cpuQNum1 = 0

```
cpuQNum2 = 0
npuIndex = 0
stripSeg = 0
copySeg = 0

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

<#root>

```
C9400#
```

show platform software fed active ifm mappings

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

<#root>

```
C9400#
```

show etherchannel summary

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

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

<#root>

```
C9400#
```

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

```
ASIC#0:

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

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

```
MAC Addr:
```

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

ASIC#1:

Rewrite Data Table Entry,
ASIC#:1, rewrite_type:1, RI:41

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

ASIC#2:
--snip--
ASIC#3:
--snip--
ASIC#4:
--snip--
ASIC#5:
--snip--
```

<#root>

```
C9400#

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

          Mac Address Table
-------------------------------------------

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

Programmazione diHandle

Acronimo	Definizione
diHandle	Handle indice di destinazione. Queste sono le informazioni dell'interfaccia in uscita.

<#root>

```
C9400#

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

Handle:0x7fe51001b458 Res-Type:ASIC_RSC_DI Res-Switch-Num:0 Asic-Num:255 Feature-ID:AL_FID_INVALID Lkp-
priv_ri/priv_si Handle: (nil)Hardware Indices/Handles: index0:0x51c2 mtu_index/l3u_ri_index0:0x0 index1
Features sharing this resource:Cookie length: 8
01 00 00 00 c2 51 00 00
```

```
Detailed Resource Information (ASIC#0)
--snip--
Detailed Resource Information (ASIC#1)
--snip--

Detailed Resource Information (ASIC#2)
```

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

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

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

```
cmi1 = 0                                    (
```

read right to left, zero based)

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

Detailed Resource Information (ASIC#3)
```

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

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

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

```
cmi1 = 0
```

(read right to left, zero based)

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

Detailed Resource Information (ASIC#4)
--snip--
Detailed Resource Information (ASIC#5)
--snip--
```

<#root>

C9400#

show platform software fed active ifm mappings

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

<#root>

C9400#

show etherchannel summary

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

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:

<#root>

C9400#

show platform hardware fed active matm macTable vlan 100

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

```
KEY: vlan 10, mac 0x20bbc05e5351, l3_if 0, gpn 1104, epoch 0, static 0, flood_en 0, vlan_lead_wless_flo
MASK: vlan 0, mac 0x0, l3_if 0, gpn 0, epoch 0, static 0, flood_en 0, vlan_lead_wless_flood_en 0, clien
SRC_AD: need_to_learn 0, lrn_v 0, catchall 0, static_mac 0, chain_ptr_v 0, chain_ptr 0, static_entry_v
DST_AD: si 0xc7, bridge 0, replicate 0, blk_fwd_o 0, v4_mac 0, v6_mac 0, catchall 0, ign_src_lrn 0, por
--snip--
```

<#root>

```
C9400#

show platform software fed active vlan 100

VLAN Fed Information

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

<#root>

```
C9400#

show platform software fed active ifm mappings etherchannel

Mappings Table

Chan    Interface        IF_ID
-----------------------------------------------------
1       Port-channel1    0x000002ec
--snip--
```

<#root>

```
C9400#

show platform software fed active ifm if-id 0x000002ec

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 un'unica interfaccia invece che un canale porta, il comando successivo viene usato per determinare il mapping tra gpn e interfaccia:

<#root>

C9400#

show platform software fed active ifm mappings gpn

Mappings Table

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

Utilizzo di 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.

<#root>

C9400

show platform hardware fed active fwd-asic resource tcam utilization

```
CAM Utilization for ASIC Instance [0]
--snip--
CAM Utilization for ASIC Instance [1]
 --snip--
CAM Utilization for ASIC Instance [2]
 --snip--
```

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

```
 Table                                              Max Values        Used Values
 ------------------------------------------------------------------------------
 Unicast MAC addresses                              65536/1024
```

13/1 ------------> prefix/mask

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

Programmazione hardware riuscita

Tutte le funzioni (sia che si tratti di un indirizzo MAC, un'interfaccia, una 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 hardware FED è mancante o errata, è possibile utilizzare questo comando successivo per verificare la presenza di problemi e/o riconoscimenti.

<#root>

```
C9400#
```

show platform software object-manager fp active statistics

```
Forwarding Manager Asynchronous Object Manager Statistics

Object update: Pending-issue: 0, Pending-acknowledgement: 0
Batch begin:   Pending-issue: 0, Pending-acknowledgement: 0
Batch end:     Pending-issue: 0, Pending-acknowledgement: 0
```

```
Command:       Pending-acknowledgement: 0
Total-objects: 3269
Stale-objects: 0
Resolve-objects: 0
Error-objects: 0
Paused-types: 0
```

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:

<#root>

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:

<#root>

C9400#

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

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

<#root>

C9400#

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

```
Object type           Name                       Count    Del Pend       Layer
-------------------------------------------------------------------------------
CC                    cc                             5           0           2
SPA                   spa                            0           0           4
PORT_DPIDB            port_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

Traffico e policy 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 degli indirizzi MAC e sulla stabilità dello Spanning Tree.

<#root>

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).

<#root>

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 Exc
13     system-cpp-police-sw-forward              :  Sw forwarding/LOGGING/L2 LVX Data Pack/
9      system-cpp-police-multicast               :  Transit Traffic/MCAST Data/
15     system-cpp-police-multicast-end-station   :  MCAST END STATION /
7      system-cpp-police-punt-webauth            :  Punt Webauth/
1      system-cpp-police-l2-control              :  L2 Control/
5      system-cpp-police-stackwise-virt-control  :  Stackwise Virtual Control/
2      system-cpp-police-routing-control         :  Routing Control/Low Latency/
3      system-cpp-police-control-low-priority    :  General Punt/
4      system-cpp-police-l2lvx-control           :  L2 LVX Cont Pack/
8      system-cpp-police-topology-control        :  Topology Control/
11     system-cpp-police-dot1x-auth              :  DOT1X Auth/
12     system-cpp-police-protocol-snooping       :  Proto Snooping/
14     system-cpp-police-forus                   :  Forus Address resolution/Forus traffic/
5      system-cpp-police-stackwise-virt-control  :  Stackwise Virtual Control/
16     system-cpp-default                        :  DHCP Snooping/Unused/EWLC Control/EWLC Data/
```

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

<#root>

```
C9400#

show platform software infrastructure lsmpi


LSMPI interface internal stats:
enabled=0, disabled=0, throttled=0, unthrottled=0, state is ready
Input Buffers = 8801257
Output Buffers = 5506129
```

```
rxdone count = 8801257
txdone count = 5506128
Rx no particletype count = 0
Tx no particletype count = 0
Txbuf from shadow count = 0
No start of packet = 0
No end of packet = 0
Punt drop stats:
Bad version 0
Bad type 0
Had feature header 0
Had platform header 0
Feature header missing 0
Common header mismatch 0
Bad total length 0
Bad packet length 0
Bad network offset 0
Not punt header 0
Unknown link type 0
No swidb 0
Bad ESS feature header  0
No ESS feature 0
No SSLVPN feature 0
No PPP bridge feature 0
Punt For PPP bridge type packets 0
Punt For Us type unknown 0
EPC CP RX Pkt cleansed 0
Punt cause out of range 0
IOSXE-RP Punt packet causes:
       42879 Layer2 control and legacy packets
     3644168 ARP request or response packets
        7584 For-us data packets
        1794 Mcast Directly Connected Source packets
        1573 Mcast PIM signaling packets
      750076 For-us control packets
38058 Layer2 bridge domain data packet packets
     3823736 Layer2 control protocols packets

   FOR_US Control IPv4 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
```

<#root>

```
C9400#
```

show platform software infrastructure lsmpi punt

```
LSMPI punt statistics
    Total packets consumed:             876
    Total packets forwarded:            8468766
    First frag packets:                 0
    Total packets consumed & forwarded: 0

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

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

<#root>

```
C9400#
```

show platform software infrastructure inject

```
Statistics for L3 injected packets:
 5233473 total inject pak, 3 failed
 0 sent, 859329 prerouted
 0 non-CEF capable, 855296 non-unicast
 859826 IP, 0 IPv6
```

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

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

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

<#root>

```
C9400#

show platform software fed active lsmpi stat


LSMPI Statistics

-----------------------------------------
Transmit: ----------------------------------> FED transmit = FED (Supervisor) punt to CPU
     Packet Count        : 8469445
     Bytes Count         : 1055390613
     particle Count      : 8951009
     particle with App   : 7258
     Ring Full Error     : 0
     No Buff Error       : 0
     TX Ring Free        : 2047
     TX Ring Busy        : 0
     TX Ring Size        : 2048
```

```
     TXDone Ring Free    : 6816
     TXDone Ring Busy    : 9567
     TXDone Ring Size    : 16384
Receive: ---------------------------------> FED receive = CPU inject to FED (Supervisor)
     Packet Count        : 5450099
     Bytes Count         : 675084903
     Particle Count      : 5695697
     Particles with App  : 4294966854
     RX Done Count       : 5696139
     No SOP              : 0
     No EOP              : 0
     Not Enough Buf      : 0
     Max Not Enough Buf  : 0
     RX Ring Free        : 4095
     RX Ring Busy        : 0
     RX Ring Size        : 4096
     RXDone Ring Free    : 8191
     RXDone Ring Busy    : 0
     RXDone Ring Size    : 8192

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

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

<#root>

```
C9400#
```

show platform software fed active punt cause summary

```
Statistics for all causes

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

Controllare lo stato delle 31 code di punt delle singole CPU da una prospettiva FED (Supervisor).

<#root>

```
C9400#
```

show platform software fed active cpu-interface

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

<#root>

```
C9400#

show platform software fed active punt cpuq all

Punt CPU Q Statistics
=============================================

-snip-

CPU Q Id                        : 1
CPU Q Name                      : CPU_Q_L2_CONTROL

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

Send to IOSd failed count       : 0
RX suspend count                : 0
RX unsuspend count              : 0
RX unsuspend send count         : 0
RX unsuspend send failed count  : 0
```

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

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

–snip–
```

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

<#root>

```
C9400#
show platform software fed active inject cause summary


Statistics for all causes

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

Controllare lo stato delle 2 singole code di inserimento della CPU da una prospettiva FED (UADP 2.0).

<#root>

```
C9400#
```

show platform software fed active inject cpuq all

```
Inject CPU Q Statistics
=======================================

CPU Q Id                        : 0
```

CPU Q Name   : TX_CPUQ_PRIO_LOW ---> low priority CPU inject queue

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

CPU Q Id                        : 7
```

CPU Q Name   : TX_CPUQ_PRIO_HI ---> high priority CPU inject queue

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

Stats for all txq:
-------------------------------------------
TX chunk malloc fail count       : 0
-------------------------------------------
```

Statistiche eventi tabella MAC

<#root>

```
C9400#
```

show platform software fed active matm stats

```
MATM counters


Total non-cpu mac entries       : 10
Mac Learn SPI Msg Count         : 0
Mac Learn SPI Err Count         : 0
Mac Delete SPI Msg Count        : 0
Mac Delete SPI Err Count        : 0
Mac Learn Count                 : 967
```

```
Mac Add Count                   : 989
Mac AL add Count                : 971
Mac Del Count                   : 957
Mac AL Del Count                : 961

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

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

<#root>

```
C9400#

configure terminal


C9400(config)#

mac address-table notification ?

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

C9400(config)#C9400(config)#

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


C9400(config)#

mac address-table notification change ?

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

C9400(config)#

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

<#root>

C9400#

show mac address-table notification mac-move

MAC Move Notification:

enabled

<#root>

C9400#

show mac address-table notification change

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

UADP 2.0 Exception Drops

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

<#root>

C9400#

show platform hardware fed active fwd-asic drops exceptions

```
****EXCEPTION STATS ASIC INSTANCE 0 (asic/core 0/0)****
================================================================================
 Asic/core |                NAME                   |   prev   |  current  |  delta
================================================================================
0  0  NO_EXCEPTION                                    0          0           0
0  0  IPV4_CHECKSUM_ERROR                             0          0           0
0  0  ROUTED_AND_IP_OPTIONS_EXCEPTION                 0          0           0
0  0  CTS_FILTERED_EXCEPTION                          0          0           0
0  0  SIA_TTL_ZERO                                    0          0           0
0  0  ALLOW_NATIVE_EXCEPTION_COUNT                    0          0           0
0  0  ALLOW_DOT1Q_EXCEPTION_COUNT                     0          0           0
0  0  ALLOW_PRIORITY_TAGGED_EXCEPTION_COUNT           0          0           0
0  0  ALLOW_UNKNOWN_ETHER_TYPE_EXCEPTION              0          0           0
0  0  IP_SOURCE_GUARD_VIOLATION                       0          0           0
```

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

****EXCEPTION STATS ASIC INSTANCE 1 (asic/core 0/1)****
================================================================================
 Asic/core |                NAME                  |   prev   |  current  |  delta
================================================================================
0  1  NO_EXCEPTION                                 13168      16679       3511
0  1  IPV4_CHECKSUM_ERROR                          0          0           0
0  1  ROUTED_AND_IP_OPTIONS_EXCEPTION              81         103         22
```

```
--snip--
```

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:

- 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.

<#root>

```
C9400#

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


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


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

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

data path:


slot 3


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

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

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

<#root>

C9400#

show platform hardware cman fp active flowcontrol status

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

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

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

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

slot  5:   Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
           EsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
           IqsC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  - 01  -  -  -
           Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
           EsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
```

```
          IqsC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -

slot  6:   Possibly linecard is not inserted

slot  7:   Possibly linecard is not inserted
```

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.

<#root>

```
C9400#

show platform hardware cman fp active oci status


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

slot_id 1 : oci_enable Enabled    Link Status 0 (UP)
            asic_id 1 core_id 0 oci_port 3 mac_id 0
            NruRxByteGroupStats:  rxBytes 417829462717812        NruTxByteGroupStats:  txBytes 58891128

slot_id 2 : oci_enable Enabled    Link Status 0 (UP)
            asic_id 0 core_id 0 oci_port 1 mac_id 1
            NruRxByteGroupStats:  rxBytes 417938235716344        NruTxByteGroupStats:  txBytes 58891760

slot_id 5 : oci_enable Enabled    Link Status 0 (UP)
            asic_id 1 core_id 0 oci_port 4 mac_id 1
            NruRxByteGroupStats:  rxBytes 53195855717244         NruTxByteGroupStats:  txBytes 58891542

slot_id 6 : oci_enable Enabled    Link Status 1 (DOWN)
            asic_id 2 core_id 0 oci_port 6 mac_id 0
            NruRxByteGroupStats:  rxBytes 0                      NruTxByteGroupStats:  txBytes 0

slot_id 7 : oci_enable Enabled    Link Status 1 (DOWN)
            asic_id 0 core_id 0 oci_port 2 mac_id 2
            NruRxByteGroupStats:  rxBytes 0                      NruTxByteGroupStats:  txBytes 0
```

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

Controllare le statistiche ASIC Line card stub Line 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 interruzioni da queste code, è possibile utilizzare questo comando per determinare quale delle code sta riscontrando interruzioni: show platform hardware feed active go queue status interface Gig 1/0/13

<#root>

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_

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--+
           |              |
```

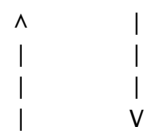
---> Supervisor ASIC 1, core 0 on the slot 3 active Supervisor associated with interface Gig1/0/13

```
           |   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



```
==============================================
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.

<#root>

C9400#

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

```
Slot 1 - number of ports 48

slot  1:   Port 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
```

```
IsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
IqmC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
IsmF  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
IqmC  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -  -
```

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

<#root>

C9400#

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

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

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

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.

<#root>

C9400#

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

```
Port  Interface                       Status    Interface
```

Group Max <-- aggregate bandwidth for 8 ports

```
Group                                           Bandwith
```

Bandwidth

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

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