

在Intersight管理模式下排除本徵VLAN問題

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簡介

本檔案介紹Cisco Intersight管理模式環境中的本徵VLAN配置選項，突出顯示常見方案。

必要條件

需求

思科建議您瞭解以下主題：

- 對統一計算系統伺服器(UCS)的基本瞭解
- 對Intersight管理模式(IMM)的基本瞭解
- 對ESXi和Windows作業系統有基礎認識
- 網路基礎知識

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- Intersight管理模式(IMM)

- UCSX-215C-M8
- UCSC-C240-M7SX
- 6536光纖互連
- 6454光纖互連
- 伺服器X系列韌體版本5.3(0.240016)
- 交換矩陣互聯6536韌體版本4.3(5.250004)
- 伺服器C系列韌體版本4.3(4.241063)
- 交換矩陣互聯6536韌體版本4.2(3m)

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除 (預設) 的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

背景資訊

Cisco Intersight-Managed Mode環境中的本徵VLAN配置選項具有導致雙標籤的常見方案。本文還提供推薦的故障排除步驟。

在Cisco UCS中，網絡卡介面卡被虛擬化，並通過vNIC呈現給作業系統。這些虛擬介面卡連線到通常配置為中繼埠的虛擬乙太網介面(vEthernet)。本徵VLAN用於通過中繼埠傳輸未標籤的流量 (或不使用802.1Q標籤的流量) 。

根據已安裝的作業系統，它可以具有或不對自己的流量進行標籤的功能。例如，VMWare ESXi能夠標籤多個VLAN。對於無法或不需要VLAN標籤的作業系統，建議為要用於未標籤流量的預設VLAN選擇本徵VLAN。

疑難排解案例

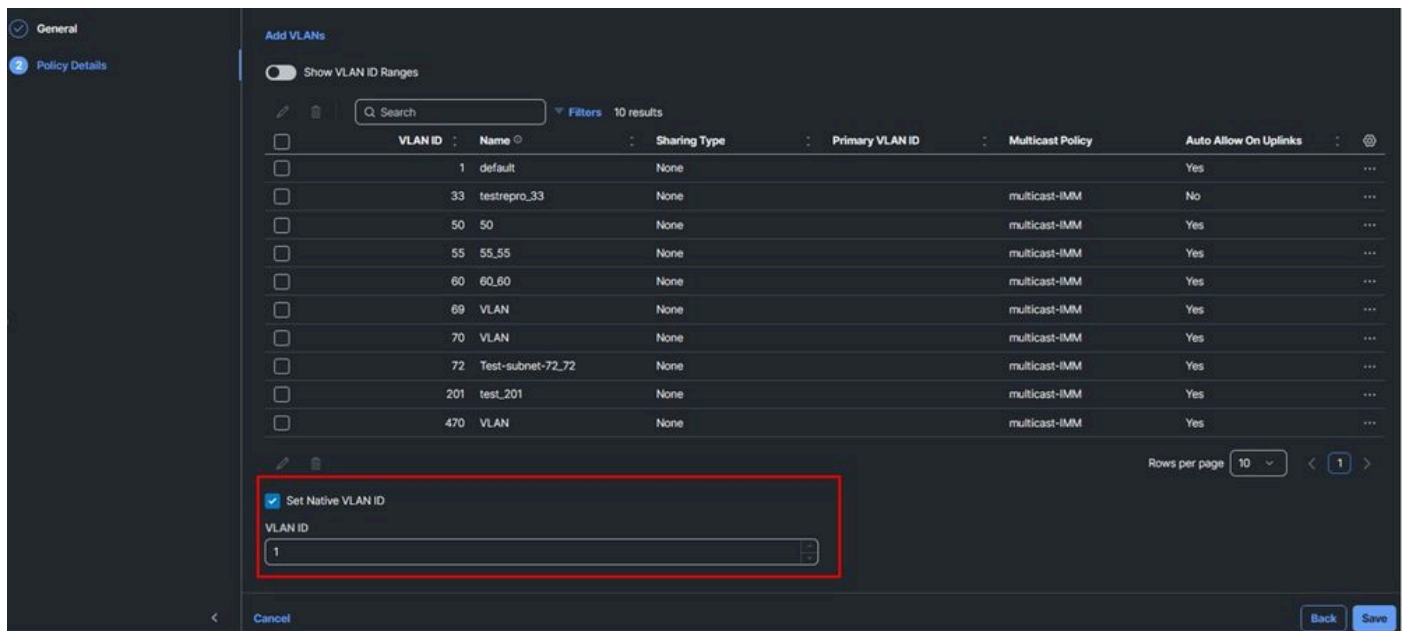
VMware ESXi

vNIC、FI上行鏈路或上游網路裝置上沒有配置本徵VLAN

在本例中，環境中使用VLAN 470和72。以下是包含工作情景的範例。

- 上行鏈路中未配置本徵VLAN。

域配置檔案：



通過CLI:

FI-A:

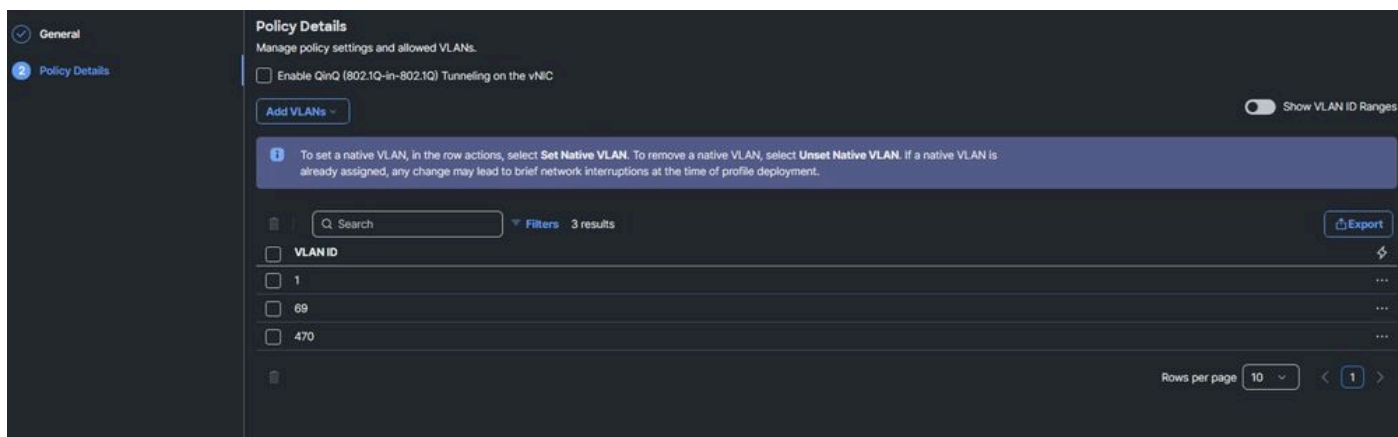
```
6536-A(nx-os)# show running-config interface ethernet 1/1
description Uplink PC Member
pinning border
switchport mode trunk
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

FI-B:

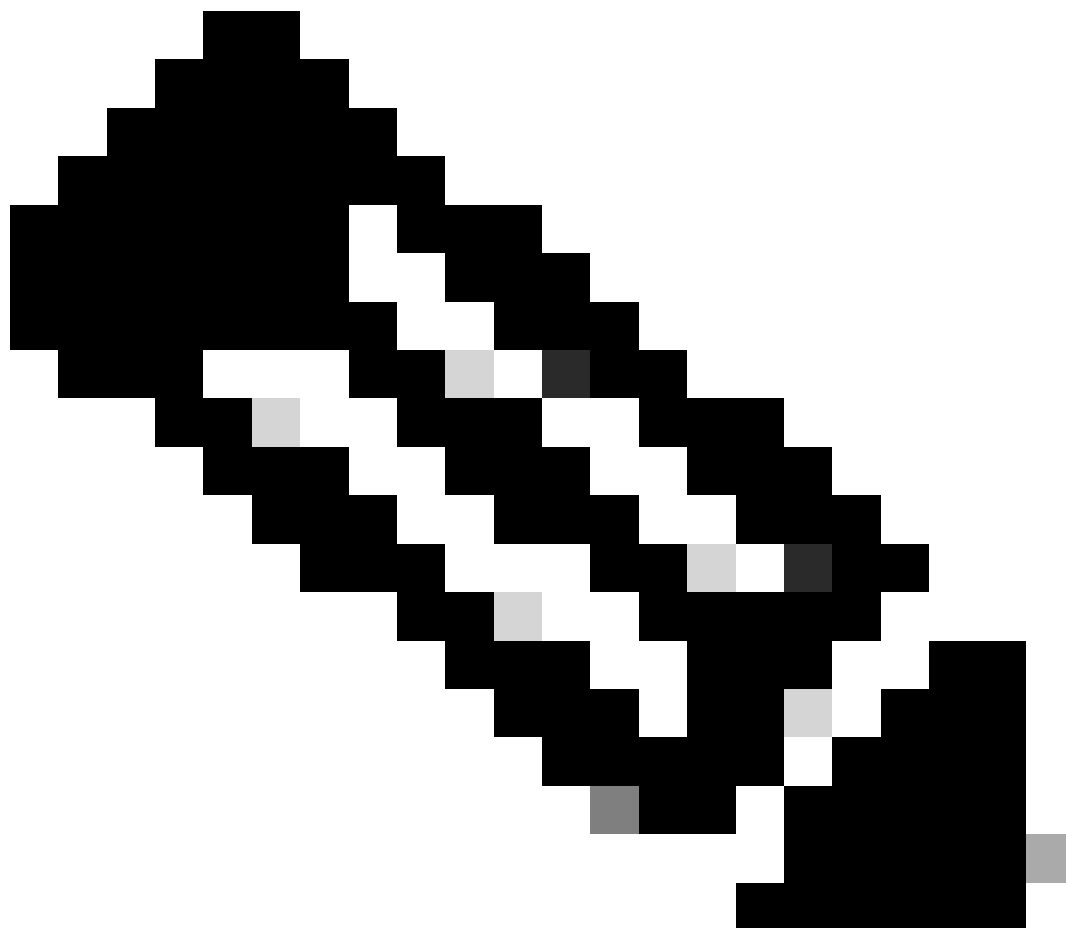
```
6536-B(nx-os)# show running-config interface ethernet 1/1
description Uplink PC Member
pinning border
switchport mode trunk
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

- vNIC中未配置本徵VLAN。

乙太網路組策略：



通過CLI:



附註：您可以通過Servers > Inventory > Network Adapters路徑檢視伺服器中的vEthernet，然後選擇VIC卡，然後按一下Interfaces。

General

Inventory

UCS Server Profile

HCL

Topology

Metrics

Connectivity

Expand All

Motherboard

Boot

Management Controller

CPUs

Memory

Network Adapters

- Adapter UCSX-ME-V5Q50G_FCH281175L9
- Adapter UCSX-ML-V5Q50G_FCH2817742H

Storage Controllers

TPM

Adapter UCSX-ML-V5Q50G_FCH2817742H

General

Interfaces

DCE Interfaces

Name	OperState	IO Module Port	MAC Address
1	up	chassis-1-loc-2-muxhostport-port-29	EC:19:2E:56:5A:09
2	up	chassis-1-loc-2-muxhostport-port-30	EC:19:2E:56:5A:0A
3	up	chassis-1-loc-1-muxhostport-port-29	EC:19:2E:56:5A:0B
4	up	chassis-1-loc-1-muxhostport-port-30	EC:19:2E:56:5A:0C

NIC Interfaces

Name	MAC Address	QinQ VLAN	VIF ID	Active Oper State	Passive VIF ID	Passive Oper State	QoS Policy	Rate Limit (Mbps)
vNIC-A	00:25:85:01:00:34	-	800	Up	-	-	IMM-QOS	100000
vNIC-B	00:25:85:01:00:35	-	801	Up	-	-	IMM-QOS	100000

HBA Interfaces

Name	WWPN	VIF ID	Oper State	QoS Policy	Rate Limit (Mbps)
------	------	--------	------------	------------	-------------------

NO ITEMS AVAILABLE

FI-A:

```
6536-A(nx-os)# show running-config interface vethernet 800
interface Vethernet800
  switchport mode trunk
  switchport trunk allowed vlan 1,69,470
```

FI-B:

```
6536-B(nx-os)# show running-config interface vethernet 801
interface Vethernet801
  switchport mode trunk
  switchport trunk allowed vlan 1,69,470
```

- OS中配置的VLAN:

Configure Management Network	VLAN (optional)
Network Adapters VLAN (optional) IPv4 Configuration IPv6 Configuration DNS Configuration Custom DNS Suffixes	470 A VLAN is a virtual network within a physical network. Because several VLANs can co-exist on the same physical network segment, VLAN configuration and partitioning is often more flexible, better isolated, and less expensive than flat networks based on traditional physical topology. If you are unsure how to configure or use a VLAN, it is safe to leave this option unset.

- Ping測試成功：

```
C:\Users\>ping 10.31.123.106

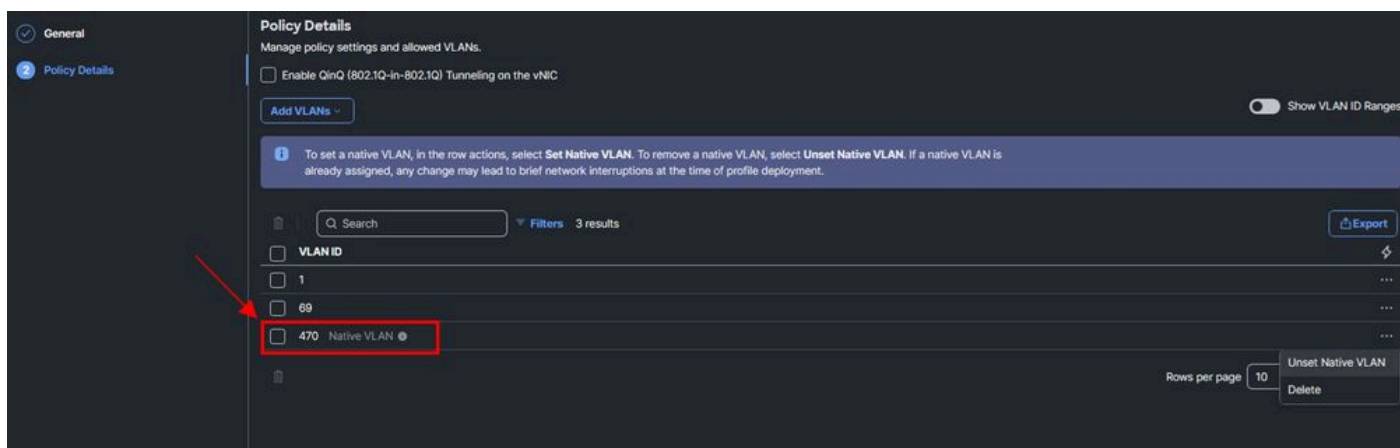
Pinging 10.31.123.106 with 32 bytes of data:
Reply from 10.31.123.106: bytes=32 time<1ms TTL=64
Reply from 10.31.123.106: bytes=32 time<1ms TTL=64
Reply from 10.31.123.106: bytes=32 time<1ms TTL=64
Reply from 10.31.123.106: bytes=32 time<1ms TTL=64

Ping statistics for 10.31.123.106:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

場景1.本徵VLAN配置在vNIC級別

如果在乙太網路組中將VLAN配置為Native，則可能會由於VLAN標籤問題而導致網路連線丟失。

- 乙太網路組中的配置：



通過CLI:

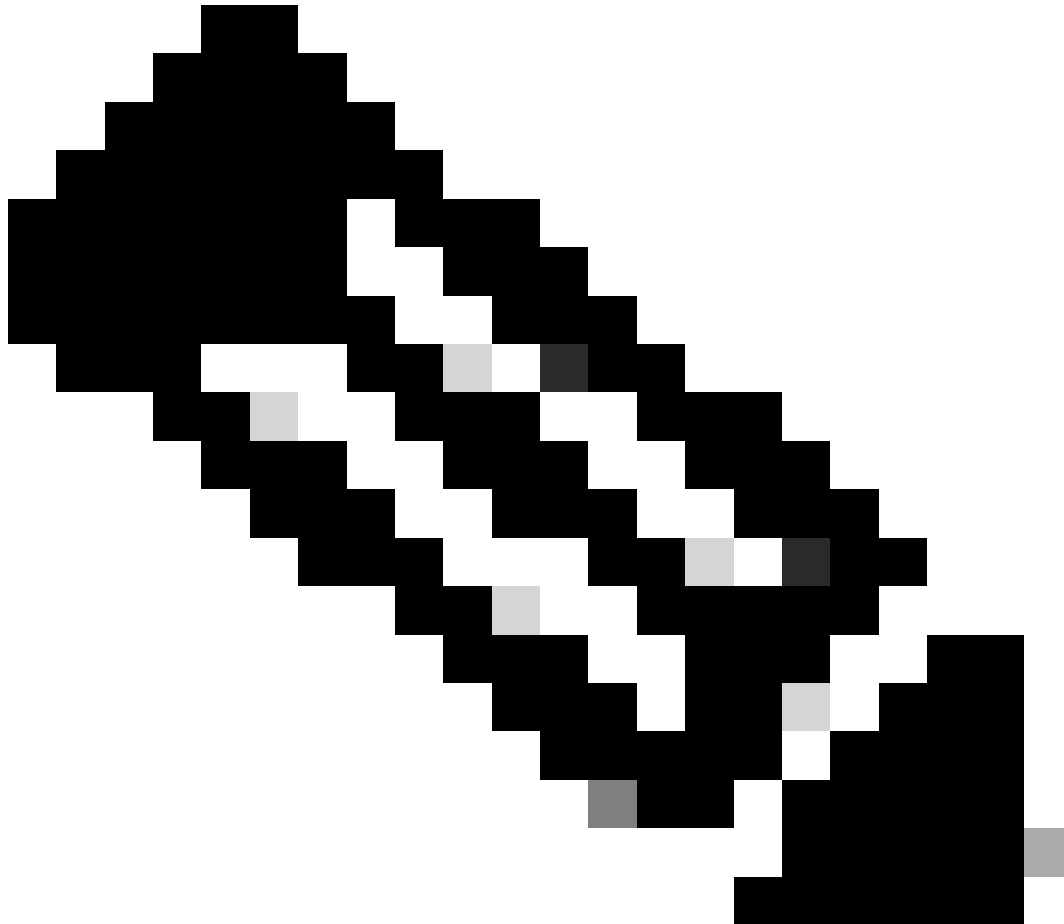
FI-A:

```
6536-A(nx-os)# show running-config interface vethernet 800
interface Vethernet800
    switchport mode trunk
    switchport trunk native vlan 470 <<<<<<<<
    switchport trunk allowed vlan 1,69,470
```

FI-B:

```
6536-B(nx-os)# show running-config interface vethernet 801
interface Vethernet801
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<
  switchport trunk allowed vlan 1,69,470
```

- Ping測試失敗。
-



附註：一旦從網路組中刪除本徵VLAN，連線就會恢復。

案例2.在FI上行鏈路中設定原生VLAN

- Via CLI:

FI地址

```
6536-A(nx-os)# show running-config interface ethernet 1/1
description Uplink PC Member
switchport mode trunk
switchport trunk native vlan 470 <<<<<<<<<<
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

FI-B

```
6536-B(nx-os)# show running-config interface ethernet 1/1
switchport mode trunk
switchport trunk native vlan 470 <<<<<<<<<<
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

如果嘗試使用上行鏈路中配置的本徵VLAN對作業系統執行ping操作，ping測試會失敗。

要修復此情況，您需要從上行鏈路中刪除VLAN，並保留在ESXi(OS)級別配置的VLAN。

本徵VLAN配置在vNIC、FI上行鏈路和上游網路裝置

為了這一娛樂活動，使用了另一個VLAN。在此案例中，使用的VLAN為72。

注意事項：

1. VLAN 72在Catalyst DG中配置為本徵。
2. VLAN 72被配置為Nexus裝置中的本徵。
3. VLAN 72在FI上行鏈路中配置為本徵。
4. VLAN 72在vNIC中配置為Native。
5. 作業系統中未標籤VLAN。

Configure Management Network	VLAN (optional)
Network Adapters VLAN (optional) IPv4 Configuration IPv6 Configuration DNS Configuration Custom DNS Suffixes	Not set A VLAN is a virtual network within a physical network. Because several VLANs can co-exist on the same physical network segment, VLAN configuration and partitioning is often more flexible, better isolated, and less expensive than flat networks based on traditional physical topology. If you are unsure how to configure or use a VLAN, it is safe to leave this option unset.

如果您使用這些注意事項，並嘗試執行ping測試，可以看到ping是否按預期工作：

Testing Management Network

You may interrupt the test at any time.

Pinging address #1 (192.168.72.1).
Pinging address #2 (192.168.72.25).

OK.
OK.

作業系統級別的資料包捕獲：

檢視資料平面是否按預期工作的另一種方法是，您可以在作業系統級別執行資料包捕獲。對於本故障排除文章，您使用pktcap-uw工具來捕獲流經物理網路介面卡的流量，例如：

```
pktcap-uw --uplink vmnic0 --dir 2 -o /vmfs/volumes/datastore1/pcaps/nativeworking.pcap -i icmp:
```

No.	Time	Source	Destination	Protocol	Length	Info
→ 1	0.000000	10.31.123.45	192.168.72.25	ICMP	74	Echo (ping) request id=0x000a, seq=12681/35121, ttl=127 (reply in 2)
← 2	0.000112	192.168.72.25	10.31.123.45	ICMP	74	Echo (ping) reply id=0x000a, seq=12681/35121, ttl=64 (request in 1)
7	1.018514	10.31.123.45	192.168.72.25	ICMP	74	Echo (ping) request id=0x000a, seq=12682/35377, ttl=127 (reply in 8)
8	1.018625	192.168.72.25	10.31.123.45	ICMP	74	Echo (ping) reply id=0x000a, seq=12682/35377, ttl=64 (request in 7)

ELAM捕獲：

ELAM捕獲在排除本徵VLAN問題時非常有用，該工具允許即時檢視在ASIC級別轉發的資料包。它不會中斷資料平面，出於故障排除目的，只關注源裝置和目的裝置的MAC和IP地址。

資料包工作時的示例：

```
root@IMM-SAAS-MXSVLAB-6536-A(nx-os)# attach module 1
root@module-1# debug platform internal tah elam asic 0
root@module-1(TAH-elam)# trigger init asic 0 slice 1 lu-a2d 1 in-select 6 out-select 0
Slot 1: param values: start asic 0, start slice 1, lu-a2d 1, in-select 6, out-select 0
root@module-1(TAH-elam-insel6)# set outer ipv4 src_ip 192.168.72.25 dst_ip 192.168.72.1
root@module-1(TAH-elam-insel6)# start
root@module-1(TAH-elam-insel6)# report
HEAVENLY ELAM REPORT SUMMARY
slot - 1, asic - 0, slice - 1
=====
```

```
Incoming Interface: Eth1/10
Src Idx : 0x1001, Src BD : 72
Outgoing Interface Info: dmod 1, dpid 72
Dst Idx : 0x601, Dst BD : 72
```

Packet Type: IPv4

```
Dst MAC address: B0:8B:CF:C8:A2:6B
Src MAC address: 00:25:B5:01:00:34
.1q Tag0 VLAN: 72, cos = 0x0
```

```
Dst IPv4 address: 192.168.72.1
Src IPv4 address: 192.168.72.25
Ver      = 4, DSCP      = 0, Don't Fragment = 0
Proto    = 1, TTL      = 64, More Fragments = 0
Hdr len  = 20, Pkt len  = 84, Checksum      = 0xc0a9
```

L4 Protocol : 1

```
ICMP type      : 8
ICMP code      : 0
```

```
Drop Info:
-----
```

```
LUA:
LUB:
LUC:
LUD:
Final Drops:
```

```
vntag:
vntag_valid    : 1
vntag_vir      : 195
vntag_svif     : 195
```

在獲得的輸出中，很顯然src和dst在VLAN 72上。這是預期的，因為您知道您在所有路徑中都使用VLAN 72作為本徵，它到達了埠ethernet 1/10（指定了dpid 72介面），dpid是ASIC埠內部識別符號，可以使用show interface hardware-mappings找到對映：

```
6536-A(nx-os)# show interface hardware-mappings
```

Name	Ifindex	Smod	Unit	HPort	FPort	NPort	VPort	Slice	SPort	SrcId	MacId	MacSP	VIF	Block	BlkSrcID
Eth1/1	1a000000	1	0	72	255	0	-1	1	0	0	18	0	1537	0	0

```
6536-A(nx-os)# show hardware internal tah interface ethernet 1/1
```

```
#####
```

```
IfIndex: 0x1a000000
```

```
DstIndex: 6144
```

```
IfType: 26
```

```
Asic: 0
```

```
Asic: 0
```

```
AsicPort: 72
```

```
SrcId: 0
```

```
Slice: 1
```

```
PortOnSlice: 0
```

```
Table entries for interface Ethernet1/1
```

根據show interface hardware-mappings命令中獲得的資訊，目的地連線埠是連線埠Ethernet 1/1，它是UCS網域中的上行鏈路之一。

案例1.本徵VLAN在FI上行鏈路中配置，未在vNIC上配置上游裝置

這次，ICMP請求顯然停止工作，這是預期的結果，因為本徵VLAN已從vNIC中刪除：

ELAM捕獲。

在這種情況下，無法對其執行ping操作，並且如果您嘗試使用源和目標的IP地址，則由於無連線，該操作不起作用。在此特定情況下，將MAC位址設定為篩選條件以取得詳細資訊：

```

root@module-1(TAH-elam-insel6)# set outer 12 src_mac 00:25:B5:01:00:34 dst_mac ff:ff:ff:ff:ff:ff
root@module-1(TAH-elam-insel6)# start
root@module-1(TAH-elam-insel6)# report
HEAVENLY ELAM REPORT SUMMARY
slot - 1, asic - 0, slice - 1
=====

```

```

Incoming Interface: Eth1/10
Src Idx : 0x1001, Src BD : 1
Outgoing Interface Info: dmod 1, dpid 72
Dst Idx : 0x601, Dst BD : 72

```

Packet Type: ARP

```

Dst MAC address: FF:FF:FF:FF:FF:FF
Src MAC address: 00:25:B5:01:00:34
.lq Tag0 VLAN: 1, cos = 0x0

```

```

Target Hardware address: 00:00:00:00:00:00
Sender Hardware address: 00:25:B5:01:00:34
Target Protocol address: 192.168.72.1
Sender Protocol address: 192.168.72.25
ARP opcode: 1

```

```

Drop Info:
-----

```

```

LUA:
LUB:
LUC:
LUD:
Final Drops:

```

```

vntag:
vntag_valid    : 1
vntag_vir      : 195
vntag_svif     : 195

```

```

6536-A(nx-os)# show interface hardware-mappings

```

Name	Ifindex	Smod	Unit	HPort	FPort	NPort	VPort	Slice	SPort	SrcId	MacId	MacSP	VIF	Block	BlkSrcID
Eth1/1	1a000000	1	0	72	255	0	-1	1	0	0	18	0	1537	0	0

您可以看到MAC地址00:25:B5:01:00:34(vNIC-A)使用的VLAN是VLAN 1，這是不正確的，因為您需要使用VLAN 72。

案例2.本徵VLAN是在vNIC上配置的，但上游裝置未在FI上行鏈路中配置

ELAM捕獲：

```

root@module-1(TAH-elam-insel6)# set outer 12 src_mac 00:25:B5:01:00:34 dst_mac ff:ff:ff:ff:ff:ff
root@module-1(TAH-elam-insel6)# start
root@module-1(TAH-elam-insel6)# report

```

```
HEAVENLY ELAM REPORT SUMMARY
slot - 1, asic - 0, slice - 1
=====
```

```
Incoming Interface: Eth1/10
Src Idx : 0x1001, Src BD : 72
Outgoing Interface Info: met_ptr 0
```

```
Packet Type: ARP
```

```
Dst MAC address: FF:FF:FF:FF:FF:FF
Src MAC address: 00:25:B5:01:00:34
.1q Tag0 VLAN: 72, cos = 0x0
```

```
Target Hardware address: 00:00:00:00:00:00
Sender Hardware address: 00:25:B5:01:00:34
Target Protocol address: 192.168.72.1
Sender Protocol address: 192.168.72.25
ARP opcode: 1
```

```
Drop Info:
-----
```

```
LUA:
LUB:
LUC:
LUD:
Final Drops:
```

```
vntag:
vntag_valid    : 1
vntag_vir      : 195
vntag_svif     : 195
```

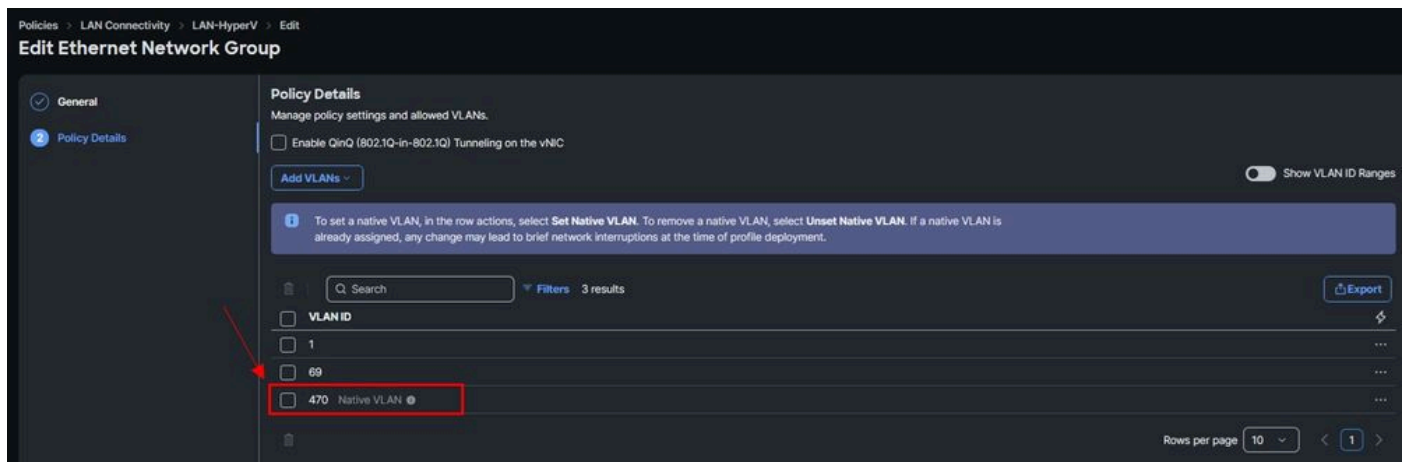
在輸出中，顯然使用了正確的VLAN 72。但是，如果您檢查上行鏈路中的配置，可以看到本地VLAN未配置：

```
6536-A(nx-os)# show running-config interface ethernet 1/1
description Uplink PC Member
switchport mode trunk
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

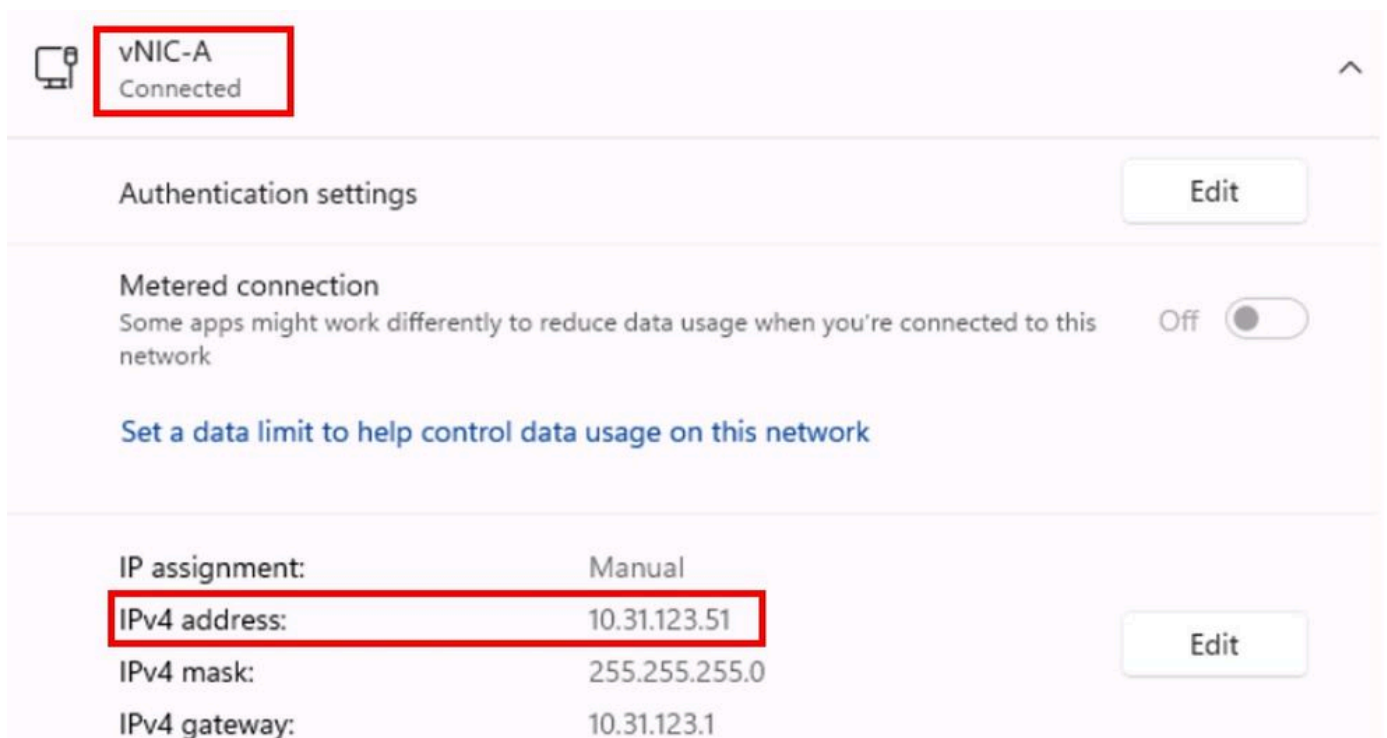
Windows Server作業系統

本徵VLAN問題也可能在Windows作業系統中存在，通常由於本徵VLAN未在vNIC上標籤，因此可能會發生此問題。

在此案例中，使用原生VLAN 470:



vNIC在Windows中連線：



封包捕獲

如果嘗試ping網路，可以看到封包擷取如預期般運作，因為原生VLAN已在vNIC中標籤：

No.	Time	Source	Destination	Protocol	Length	Info
1632	157.599402	10.31.123.45	10.31.123.51	ICMP	74	Echo (ping) request id=0x000a, seq=29175/63345, ttl=128 (reply in 1632)
1632	157.599645	10.31.123.51	10.31.123.45	ICMP	74	Echo (ping) reply id=0x000a, seq=29175/63345, ttl=128 (request in 1631)
1634	157.881196	10.61.94.90	10.31.123.51	ICMP	74	Echo (ping) request id=0x0002, seq=6442/10777, ttl=106 (reply in 1635)
1635	157.881469	10.31.123.51	10.61.94.90	ICMP	74	Echo (ping) reply id=0x0002, seq=6442/10777, ttl=128 (request in 1634)

案例1.本徵VLAN在FI上行鏈路中配置，但未在vNIC中配置

- vNIC級別：

```
6454-A(nx-os)# show running-config interface vethernet 801
interface Vethernet801
```

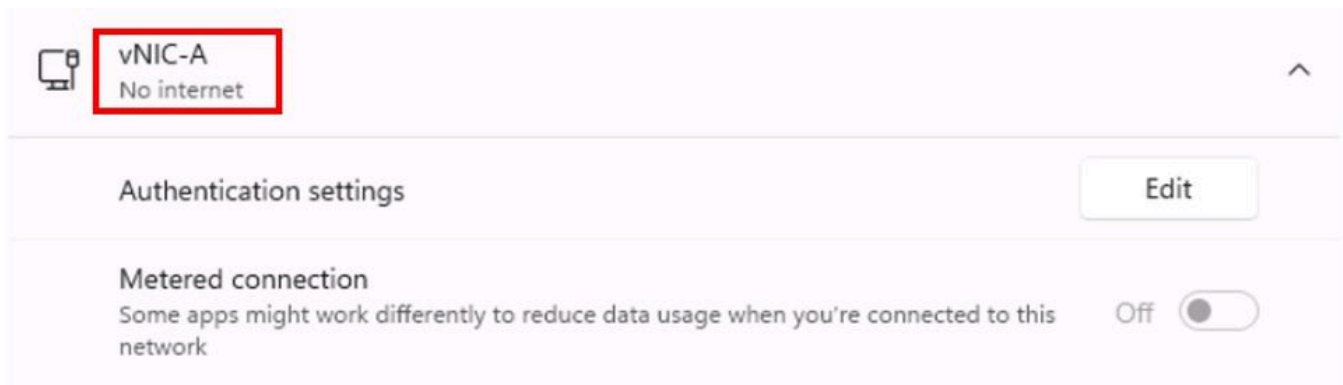
```
switchport mode trunk
switchport trunk allowed vlan 1,69,470
```

- FI-A級別：

```
6454-A(nx-os)# show running-config interface ethernet 1/15-16
interface Ethernet1/15
  description Uplink PC Member
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<<
  switchport trunk allowed vlan 1,69-70,72,470

interface Ethernet1/16
  description Uplink PC Member
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<<
  switchport trunk allowed vlan 1,69-70,72,470
```

在Windows中未連線使用的vNIC:



如果嘗試執行ping，則預期此操作無法正常工作。

案例2.在FI上行鏈路和vNIC上配置本徵VLAN

- vNIC級別：

```
6454-A(nx-os)# show running-config interface vethernet 801
interface Vethernet801
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<<
  switchport trunk allowed vlan 1,69,470
```

- FI-A級別：

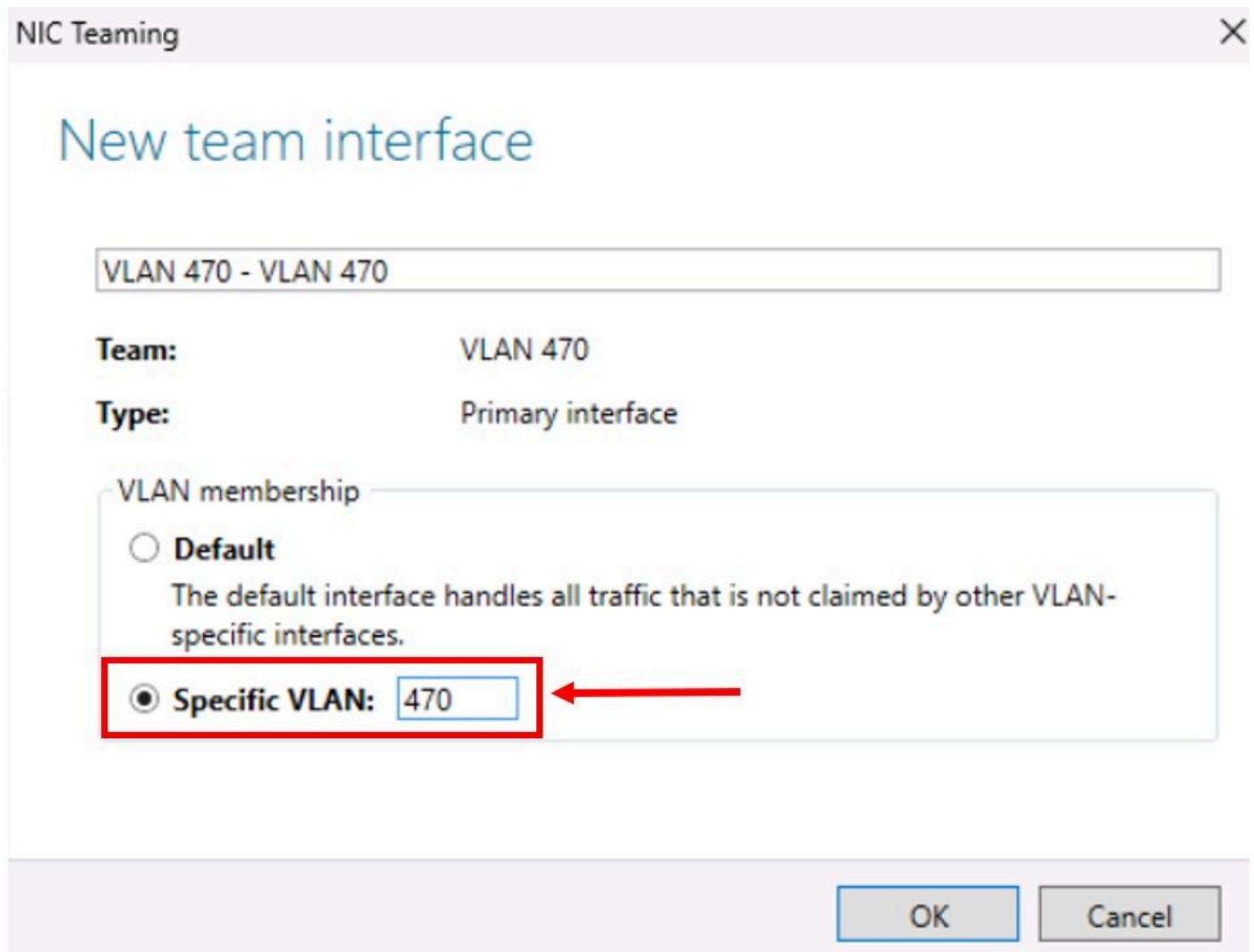
```
IMM-SAAS-MXSVLAB-6454-A(nx-os)# show running-config interface ethernet
interface Ethernet1/15
  description Uplink PC Member
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<<
  switchport trunk allowed vlan 1,69-70,72,470

interface Ethernet1/16
  description Uplink PC Member
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<<
  switchport trunk allowed vlan 1,69-70,72,470
```

此配置不允許連線，所以您執行ping測試時應該不會收到響應。

場景3.本地VLAN在作業系統和vNIC級別配置

- 作業系統端：



The image shows a 'NIC Teaming' dialog box with the title 'New team interface'. It contains a text field with 'VLAN 470 - VLAN 470'. Below this, the 'Team:' is set to 'VLAN 470' and the 'Type:' is 'Primary interface'. Under the 'VLAN membership' section, there are two radio buttons: 'Default' and 'Specific VLAN:'. The 'Specific VLAN:' option is selected and highlighted with a red box, with a red arrow pointing to it. The text next to 'Specific VLAN:' reads 'The default interface handles all traffic that is not claimed by other VLAN-specific interfaces.' At the bottom right, there are 'OK' and 'Cancel' buttons.

- vNIC級別：

```
6454-A(nx-os)# show running-config interface vethernet 801
```

```
interface Vethernet801
  switchport mode trunk
  switchport trunk native vlan 470 <<<<<<<<<<
  switchport trunk allowed vlan 1,69,470
```

- ping測試不起作用，並且您沒有連線。

相關資訊

- [Cisco Intersight託管模式配置指南](#)
- [Cisco在UCS上配置ELAM](#)
- [使用pktcap-uw工具在ESXi上捕獲資料包](#)

關於此翻譯

思科已使用電腦和人工技術翻譯本文件，讓全世界的使用者能夠以自己的語言理解支援內容。請注意，即使是最佳機器翻譯，也不如專業譯者翻譯的內容準確。Cisco Systems, Inc. 對這些翻譯的準確度概不負責，並建議一律查看原始英文文件（提供連結）。