

排除Intersight管理模式中的本征VLAN问题

目录

[简介](#)

[先决条件](#)

[要求](#)

[使用的组件](#)

[背景信息](#)

[故障排除情况](#)

[VMware ESXi](#)

[未在vNIC、FI上行链路或上游网络设备上配置本征VLAN](#)

[场景1.本征VLAN配置在vNIC级别](#)

[场景2.本地VLAN在FI上行链路中配置](#)

[本征VLAN配置在vNIC、FI上行链路和上游网络设备](#)

[场景1.本地VLAN在FI上行链路中配置，未在vNIC上配置上游设备](#)

[场景2.本征VLAN配置在vNIC上，但上游设备未配置在FI上行链路上](#)

[Windows Server操作系统](#)

[数据包捕获](#)

[场景1.本地VLAN在FI上行链路中配置，但未在vNIC中配置](#)

[场景2.本地VLAN在FI上行链路和vNIC上配置](#)

[场景3.在操作系统和vNIC级别配置本征VLAN](#)

[相关信息](#)

简介

本文档介绍Cisco Intersight-Managed Mode环境中的本征VLAN配置选项，突出显示常见场景。

先决条件

要求

Cisco 建议您了解以下主题：

- 对统一计算系统服务器(UCS)的基本了解
- 对Intersight管理模式(IMM)的基本了解
- 基本了解ESXi和Windows操作系统
- 对网络的基本了解

使用的组件

本文档中的信息基于以下软件和硬件版本：

- Intersight管理模式(IMM)

- UCSX-215C-M8
- UCSC-C240-M7SX
- 6536交换矩阵互联
- 6454交换矩阵互联
- 服务器X系列固件版本5.3(0.240016)
- 交换矩阵互联6536固件版本4.3(5.250004)
- 服务器C系列固件版本4.3(4.241063)
- 交换矩阵互联6536固件版本4.2(3m)

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

背景信息

Cisco Intersight-Managed Mode环境中的本征VLAN配置选项具有导致Double-Tagging的常见方案。本文还提供了建议的故障排除步骤。

在Cisco UCS中，NIC适配器已虚拟化，并通过vNIC呈现给操作系统。这些虚拟适配器连接到通常配置为中继端口的虚拟以太网接口(vEthernet)。本征VLAN用于通过TRUNK端口传输无标记流量（或不使用802.1Q标记的流量）。

根据安装的操作系统，它可以具有或不对其自己的流量进行标记的功能。例如，VMWare ESXi能够标记多个VLAN。对于VLAN标记不可用或不需要的操作系统，建议为要用于未标记流量的默认VLAN选择本征VLAN。

故障排除情况

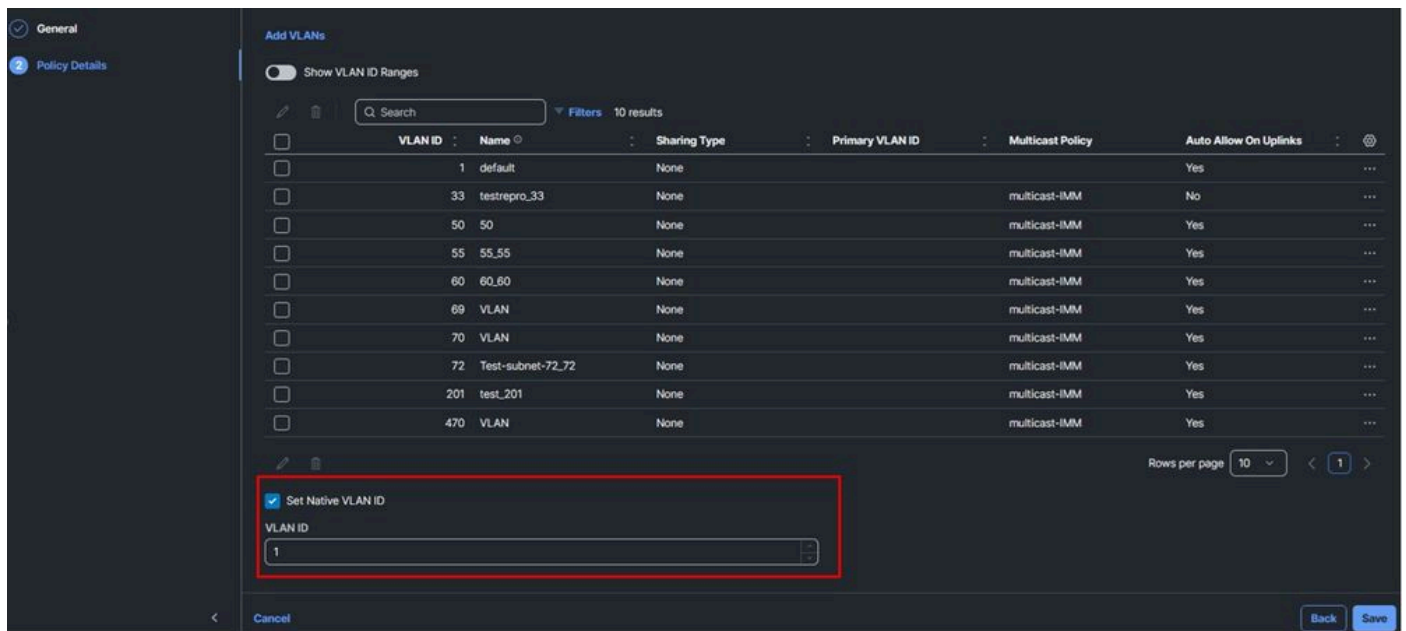
VMware ESXi

未在vNIC、FI上行链路或上游网络设备上配置本征VLAN

在本例中，VLAN 470和72在环境中使用。下面是一个工作场景示例。

- 上行链路中未配置本征VLAN。

域配置文件：



通过CLI:

FI-A:

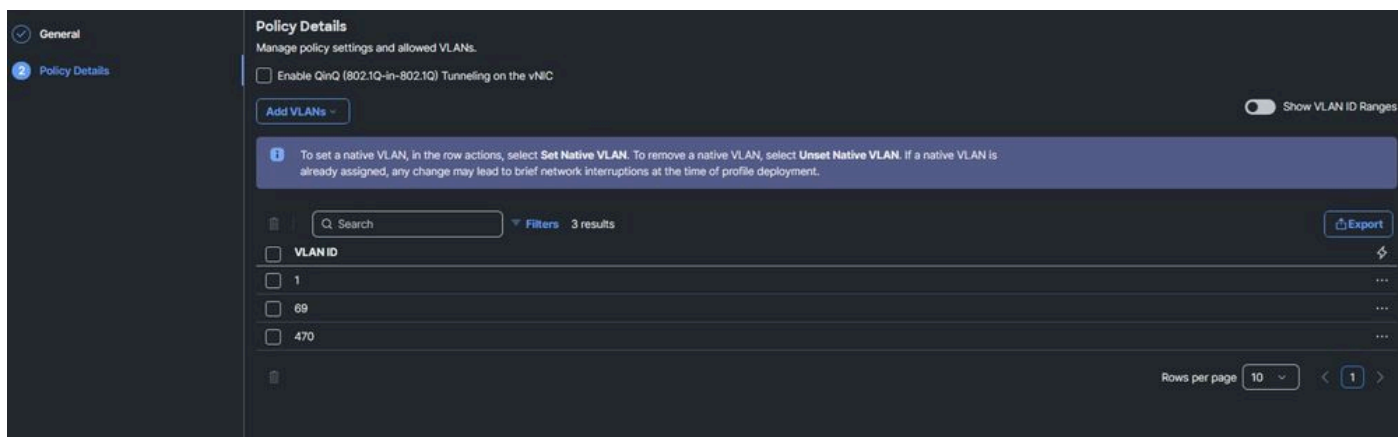
```
6536-A(nx-os)# show running-config interface ethernet 1/1
description Uplink PC Member
pinning border
switchport mode trunk
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

FI-B:

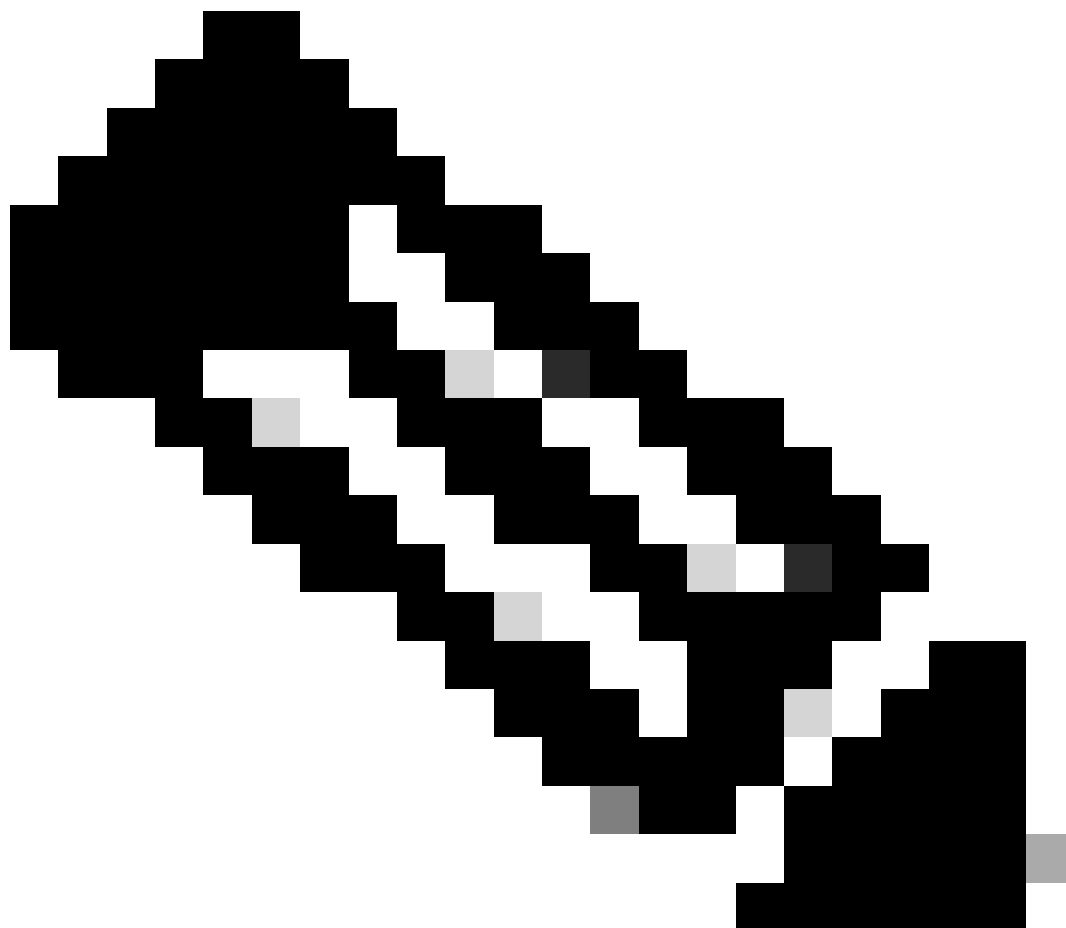
```
6536-B(nx-os)# show running-config interface ethernet 1/1
description Uplink PC Member
pinning border
switchport mode trunk
switchport trunk allowed vlan 1,50,55,60,69-70,72,201,470
```

- vNIC中没有配置本征VLAN

以太网网络组策略：



通过CLI:



注意：您可以通过路径Servers > Inventory > Network Adapters查看服务器中的vEthernet，然后选择VIC卡并点击Interfaces。

GeneralInventoryUCS Server ProfileHCLTopologyMetricsConnectivity

Expand All

Motherboard

Boot

Management Controller

CPU

Memory

Network Adapters

Adapter UCSX-ME-V5Q50G_FCH281175L9

Adapter UCSX-ML-V5Q50G_FCH2817742H

Storage Controllers

TPM

Adapter UCSX-ML-V5Q50G_FCH2817742H

GeneralInterfaces

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.

- ```
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
```

如果在以太网网络组中将VLAN配置为Native，则可能会因VLAN标记问题而导致网络连接丢失。

- General

Policy Details

Policy Details

Manage policy settings and allowed VLANs.

Enable QinQ (802.1Q-in-802.1Q) Tunneling on the vNIC

Add VLANs

Show VLAN ID Ranges

To set a native VLAN, in the row actions, select **Set Native VLAN**. To remove a native VLAN, select **Unset Native VLAN**. If a native VLAN is already assigned, any change may lead to brief network interruptions at the time of profile deployment.

Q Search

Filters 3 results

Export

| VLAN ID         |                                                             |
|-----------------|-------------------------------------------------------------|
| 1               |                                                             |
| 69              |                                                             |
| 470 Native VLAN | <div> <div>Unset Native VLAN</div> <div>Delete</div> </div> |

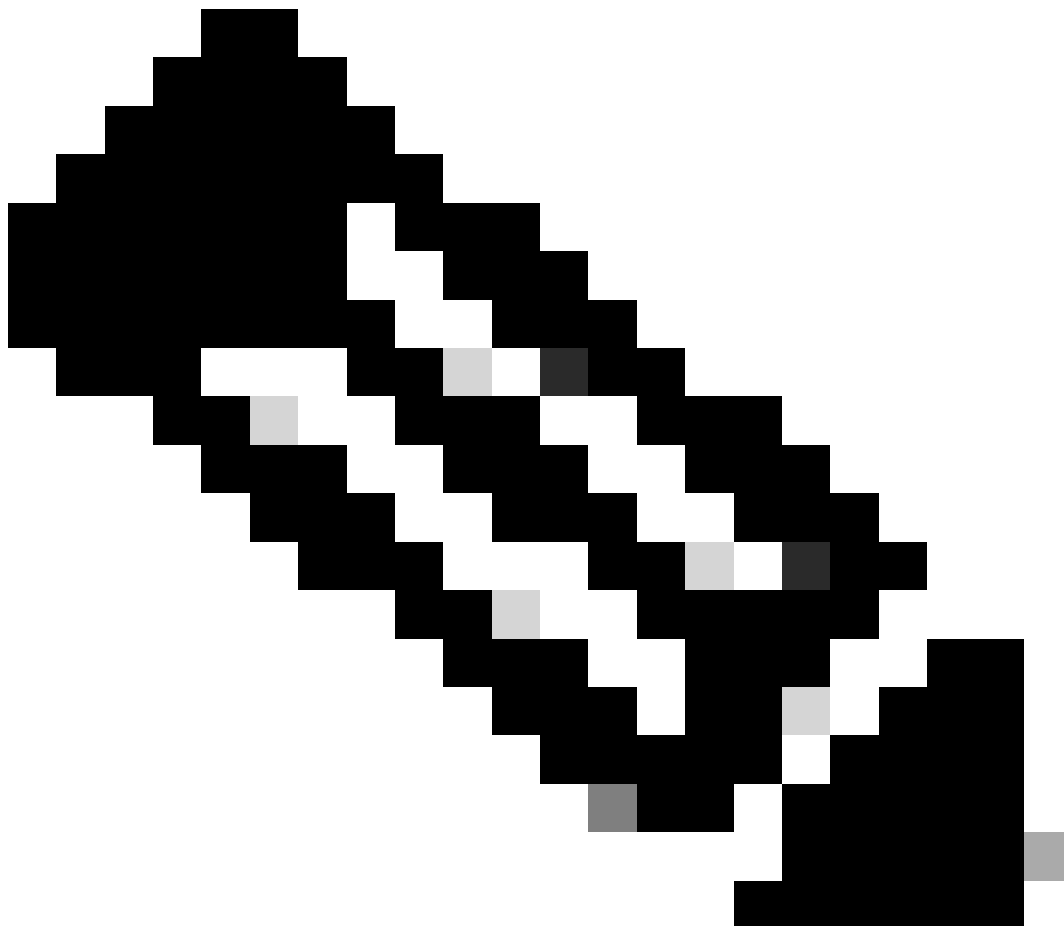
Rows per page 10

FI-A:

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测试不成功
- 



注意：从网络组中删除本征VLAN后，即可恢复连接。

---

## 场景2.本地VLAN在FI上行链路中配置

- V1a CLI:

FI-A

```
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
```

如果尝试使用上行链路中配置的本地VLAN ping操作系统，ping测试会失败。

要解决此问题，您需要从上行链路删除VLAN，并保留在ESXi(OS)级别配置的VLAN。

本征VLAN配置在vNIC、FI上行链路和上游网络设备

为此，使用了另一个VLAN。在本场景中，使用的VLAN为72。

考虑事项:

- 1. VLAN 72在Catalyst DG中配置为本征
- 2. VLAN 72在Nexus设备中配置为本征
- 3. VLAN 72在FI上行链路中配置为本征
- 4. VLAN 72在vNIC中配置为本征
- 5. 操作系统中未标记VLAN:

| Configure Management Network                                                                                                                                                   | VLAN (optional)                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div>Network Adapters</div> <div>VLAN (optional)</div> <div>IPv4 Configuration</div> <div>IPv6 Configuration</div> <div>DNS Configuration</div> <div>Custom DNS Suffixes</div> | <div>Not set</div> <div>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.</div> <div>If you are unsure how to configure or use a VLAN, it is safe to leave this option unset.</div> |

如果您使用这些注意事项并尝试ping测试，可以看到ping操作如预期一样工作：



## 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.

在操作系统级别捕获数据包：

查看数据平面是否按预期工作的另一种方法是，您可以在操作系统级别执行数据包捕获。对于本故障排除文章，您使用了pktcap-uw工具来捕获流经物理网络适配器的流量，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捕获：

当您排除本地VLAN问题时，ELAM捕获非常有用，该工具允许实时查看在ASIC级别转发的数据包。它不会对数据平面造成中断，出于故障排除目的，仅关注“源设备和目的设备的MAC和IP地址”。数据包工作时的示例：

```
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
```

在获得的输出中，src和dst显然位于VLAN 72上。这是预期结果，因为您知道您将VLAN 72用作所有路径中的本地端口，并且它到达了端口ethernet 1/10，目的地为dpid 72接口，dpid是ASIC端口内部标识符，可以使用show interface hardware-mappings找到映射：

```
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
```

根据show interface hardware-mappings命令获得的信息，目标端口是作为UCS域中上行链路之一的端口Ethernet 1/1。

场景1.本地VLAN在FI上行链路中配置，未在vNIC上配置上游设备

这次，很明显ICMP请求停止了工作，这是预期的结果，因为本征VLAN已从vNIC中删除：

ELAM捕获。

在这种情况下，无法对其执行ping操作，并且如果您尝试使用源和目标的IP地址，则它不起作用，因为没有连接。在本例中，将MAC地址设置为过滤器以获取更多信息：

```

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)所使用的VLAN是VLAN 1，这是不正确的，因为您需要使用VLAN 72。

场景2.本征VLAN配置在vNIC上，但上游设备未配置在FI上行链路上

ELAM捕获：

```

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
```

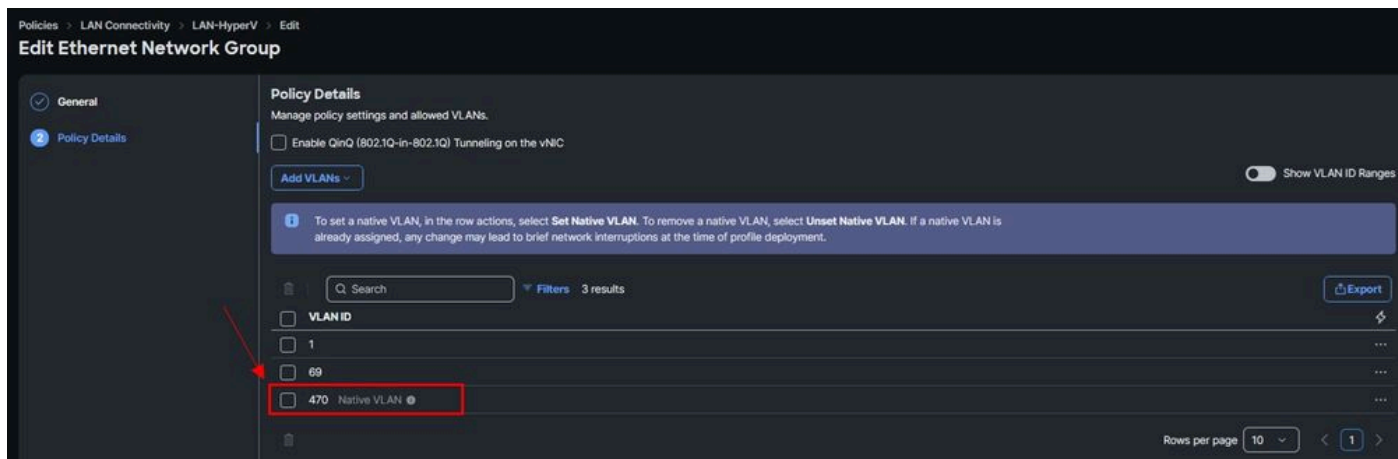
在输出中，显然使用了正确的VLAN 72。但是，如果您检查上行链路中的配置，您会发现本地VLAN未配置：

```
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
```

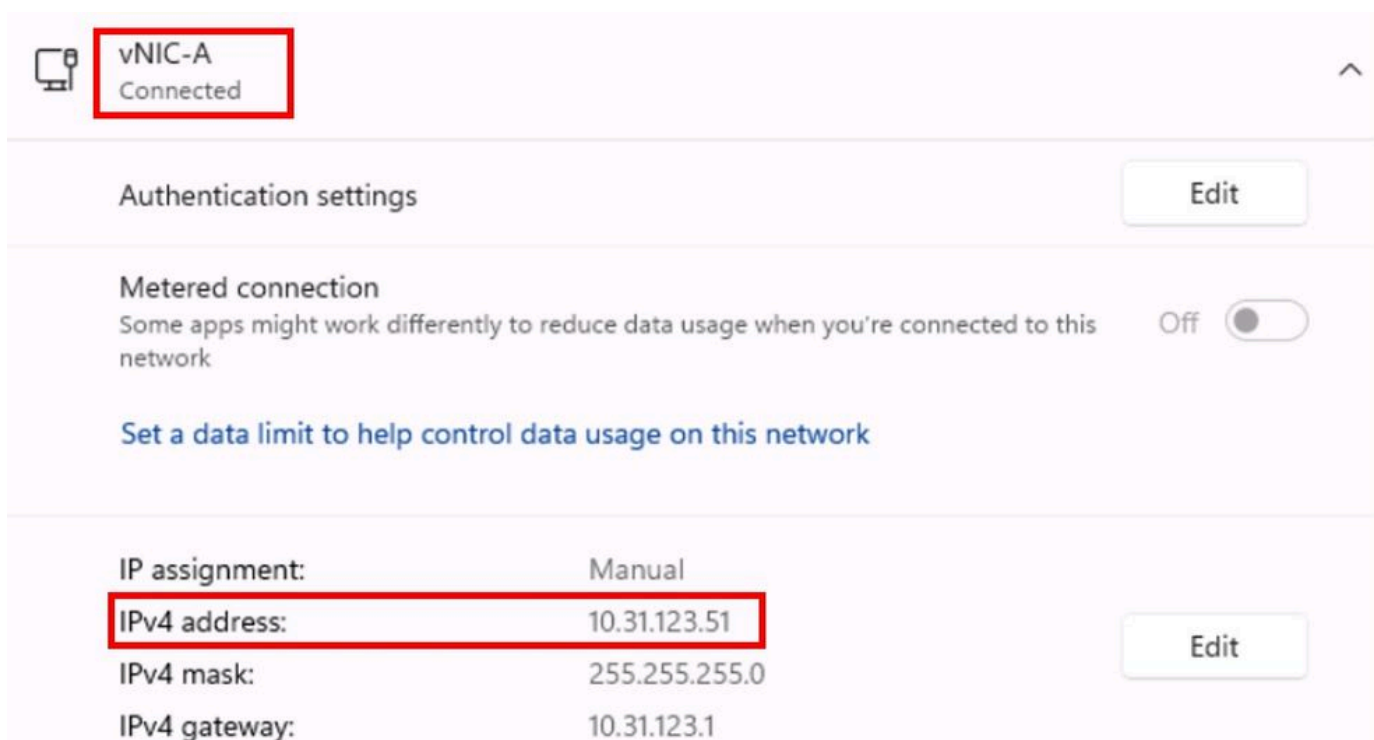
## Windows Server操作系统

本征VLAN问题也可能出现在Windows操作系统中，通常由于本征VLAN未在vNIC上标记，因此可能会发生此问题。

在本场景中，使用了本地VLAN 470:



vNIC在Windows中连接：



## 数据包捕获

如果尝试对网络执行ping操作，可以看到数据包捕获按预期运行，因为本征VLAN在vNIC中标记：

| 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)  |

## 场景1.本地VLAN在FI上行链路中配置，但未在vNIC中配置

- vNIC级别：

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

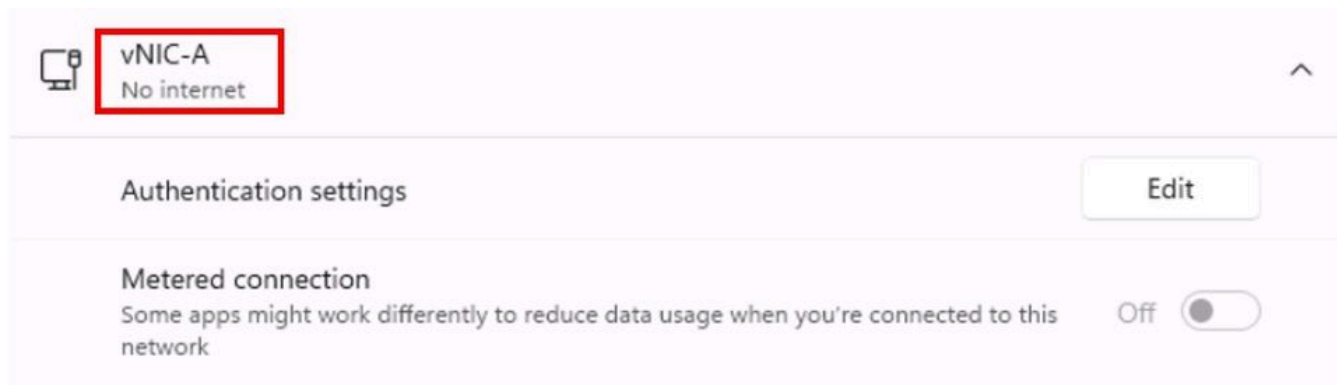
```
switchport mode trunk
switchport trunk allowed vlan 1,69,470
```

- FI-A级别：

```
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
```

未在Windows中连接使用的vNIC:



如果尝试ping，则预期此操作无法正常工作。

## 场景2.本地VLAN在FI上行链路和vNIC上配置

- vNIC级别：

```
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级别：

```

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

```

此配置不允许连接，因此您应该在执行ping测试时没有收到响应。

### 场景3.在操作系统和vNIC级别配置本征VLAN

- 操作系统端：

NIC Teaming

## New team interface

VLAN 470 - VLAN 470

**Team:** VLAN 470

**Type:** Primary interface

**VLAN membership**

☐ **Default**  
The default interface handles all traffic that is not claimed by other VLAN-specific interfaces.

☒ **Specific VLAN:** 470

OK Cancel

- vNIC级别：

```
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测试不起作用，并且您没有连接。

## 相关信息

- [Cisco Intersight管理模式配置指南](#)
- [思科在UCS上配置ELAM](#)
- [使用pktcap-uw工具在ESXi上捕获数据包](#)



## 关于此翻译

思科采用人工翻译与机器翻译相结合的方式将此文档翻译成不同语言，希望全球的用户都能通过各自的语言得到支持性的内容。

请注意：即使是最好的机器翻译，其准确度也不及专业翻译人员的水平。

Cisco Systems, Inc. 对于翻译的准确性不承担任何责任，并建议您总是参考英文原始文档（已提供链接）。