Rastreamento de endereços MAC no UCS com Nexus 1000V

Contents

Introduction

Este documento descreve como rastrear endereços MAC de uma máquina virtual (VM) e interface VMkernel (VMK) nesses níveis de rede:

- Switches Cisco Nexus 5000 Series
- Cisco Unified Computing System (UCS) 6248 Fabric Interconnect (FI)
- Host VMware ESXi
- Switch Cisco Nexus 1000V

Éimportante entender qual uplink uma VM ou uma interface VMK usa para comunicação tanto para a solução de problemas quanto para os aspectos do projeto.

Prerequisites

Requirements

A Cisco recomenda que você tenha conhecimento destes tópicos:

- Recurso vPC no Cisco NX-OS
- Cisco Unified Computing System
- VMware ESXi
- Switch Cisco Nexus 1000V

Componentes Utilizados

As informações neste documento são baseadas nestas versões de software e hardware:

- Switch Cisco Nexus 5020 versão 5.0(3)N2(2a)
- Cisco Unified Computing System versão 2.1(1d)

- Servidor blade Cisco Unified Computing System B200 M3 com Cisco Virtual Interface Card (VIC) 1240 (Palo) CNAvSphere 5.1 (ESXi e vCenter)
- Switch Cisco Nexus 1000V versão 4.2(1)SV2(1.1a)

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, make sure that you understand the potential impact of any command.
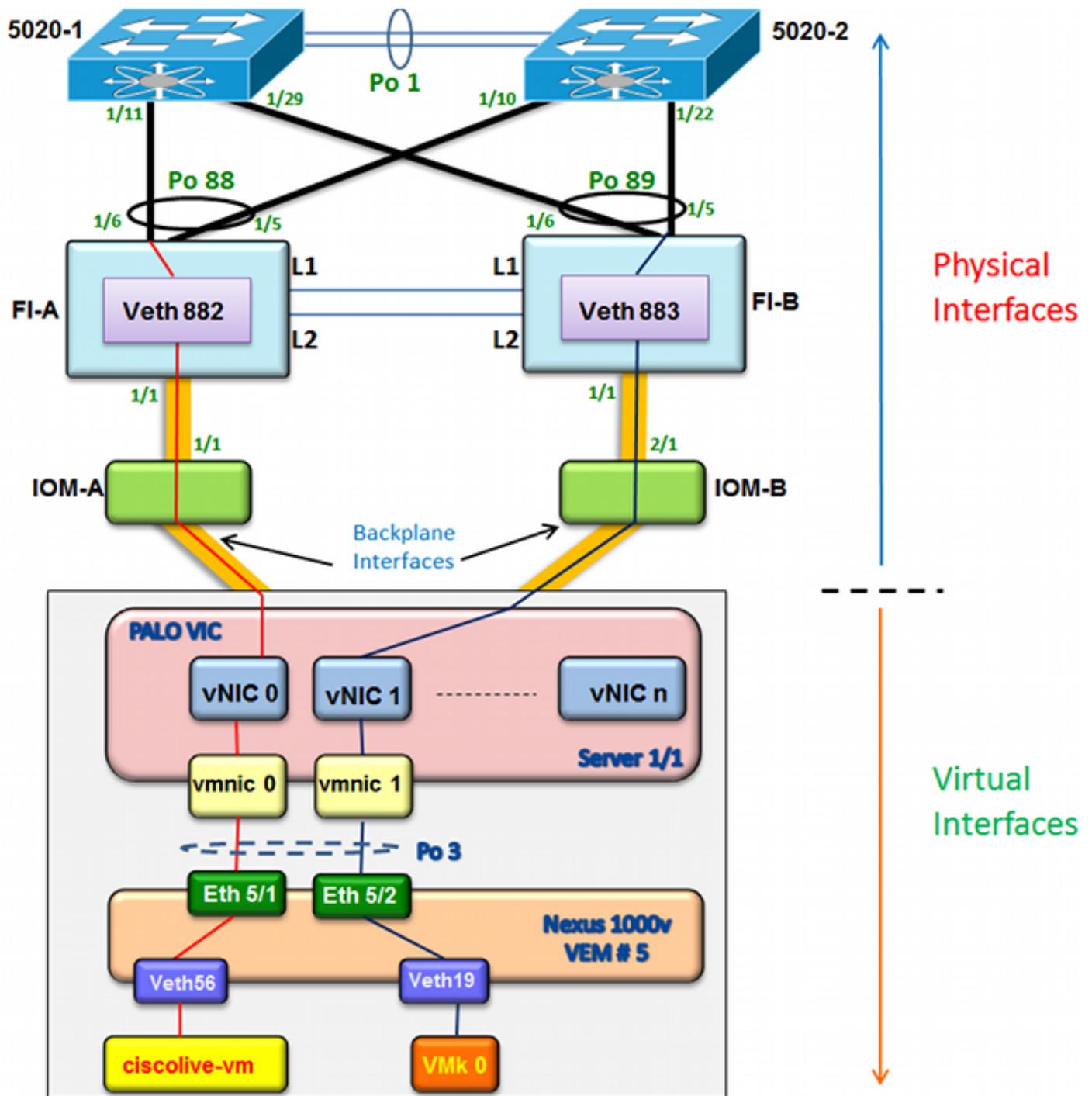
Configurar

Topologia de rede

Neste exemplo de configuração, as interfaces VM e VMK estão no mesmo host (endereço IP 172.16.18.236) e na mesma VLAN 18 (sub-rede 172.16.18.0/24).

No Nexus 1000V, o host é representado como Virtual Ethernet Module (VEM) # 5.
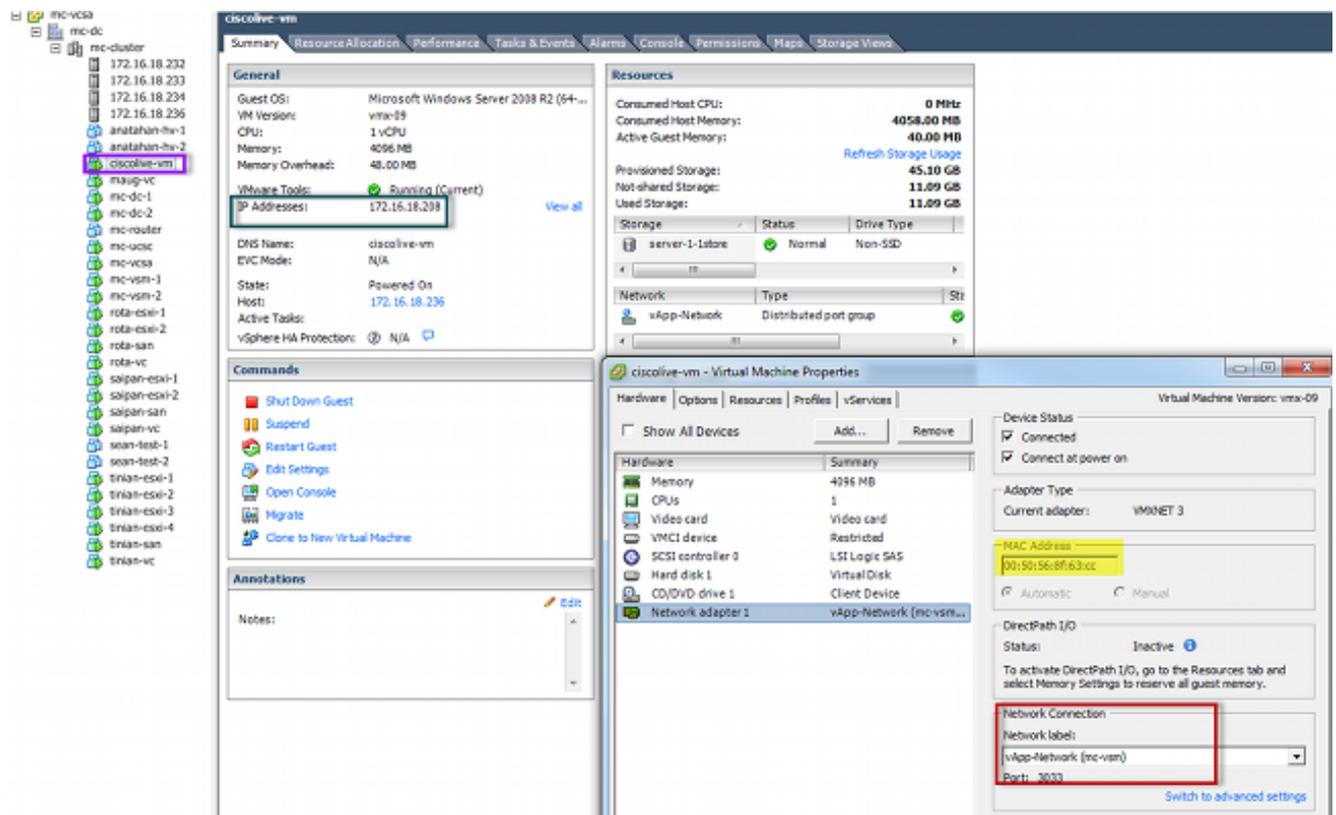
No UCS, o host é instalado no blade 1 no chassi 1.

Rastreamento de endereços MAC em diferentes segmentos de rede

Este procedimento descreve como rastrear endereços MAC em vários níveis de rede.

1. No vCenter, localize o endereço MAC da VM que deseja rastrear. Neste exemplo, o endereço MAC da VM (ciscolive-vm) é 0050:568f:63cc:

2. Insira o **comando esxcfg-vmknic -l** no shell do ESXi para encontrar o endereço MAC da interface VMK do host. Neste exemplo, o VMK (vmk0) é a interface de gerenciamento e tem um endereço MAC 0050:56:67:8e:b9:

```
mc-vsm# show mac address-table | in 8eb9
18        0050.5667.8eb9    static   0       Veth19                    5
18        0050.5667.8eb9    dynamic  0       Po4                       6
mc-vsm# show mac address-table | in 63cc
18        0050.568f.63cc    dynamic  93      Po1                       3
18        0050.568f.63cc    dynamic  93      Po2                       4
18        0050.568f.63cc    static   0       Veth56                    5
18        0050.568f.63cc    dynamic  93      Po4                       6
mc-vsm#
```

3. Confirme se os endereços MAC da VM (ciscolive-vm) e da interface VMK (vmk0) estão sendo aprendidos no host ESXi (VEM) e no Nexus 1000V.

   No nível do VEM, insira o **comando vemcmd show l2 18** para confirmar que ambos os endereços MAC são aprendidos:

```
~ # vemcmd show l2 18
Bridge domain     7 brtmax 4096, brtcnt 82, timeout 300
VLAN 18, swbd 18, ""
Flags:  P - PVLAN  S - Secure  D - Drop
        Type          MAC Address      LTL    timeout    Flags      PVLAN
      Static     00:50:56:8f:61:8b     75        0
      Static     00:50:56:8f:a4:a5     67        0
     Dynamic     00:50:56:5f:e9:a8     52        1
      Static     00:50:56:8f:51:97     78        0
     Dynamic     00:0c:29:15:fa:c6    305       27
     Dynamic     00:50:56:5f:88:58     60        1
      Static     00:50:56:8f:63:cc     68        0
     Dynamic     00:50:56:5f:7c:bd     59        1
     Dynamic     00:50:56:a2:14:f2     57        1
      Static     00:50:56:8f:11:3a     50        0
      Static     00:50:56:8f:f5:53     65        0
     Dynamic     00:50:56:a2:46:25     54        1
     Dynamic     00:50:56:8f:62:56    305        2
      Static     00:50:56:8f:21:35     54        0
     Dynamic     00:50:56:8f:86:19    305      192
      Static     00:50:56:8f:d5:fd     58        0
     Dynamic     00:02:3d:40:dd:03    305        4
     Dynamic     00:50:56:b7:70:37    305        1
     Dynamic     00:50:56:8f:c5:07    305        1
     Dynamic     00:50:56:8f:81:09    305      230
     Dynamic     00:0c:29:8b:01:22    305       73
     Dynamic     00:50:56:8f:54:48    305        6
     Dynamic     00:50:56:63:8f:4d     59        1
     Dynamic     00:50:56:8f:17:20    305        0
     Dynamic     00:50:56:8f:90:5b    305       60
      Static     00:50:56:8f:a1:3a     66        0
      Static     00:50:56:8f:45:0b     64        0
     Dynamic     00:50:56:a2:32:6f     63        2
     Dynamic     00:50:56:5f:19:5c     63        1
      Static     00:50:56:8f:90:a4     51        0
      Static     00:50:56:67:8e:b9     49        0
     Dynamic     00:25:b5:10:10:4f    305      306
```

No nível do Nexus 1000V, insira um comando **show mac address-table** para confirmar que ambos os endereços MAC são aprendidos na VLAN 18 no VEM # 5:

```
mc-vsm# show mac address-table | in 8eb9
18      0050.5667.8eb9    static  0          Veth19                          5
18      0050.5667.8eb9    dynamic 0          Po4                             6
mc-vsm# show mac address-table | in 63cc
18      0050.568f.63cc    dynamic 93         Po1                             3
18      0050.568f.63cc    dynamic 93         Po2                             4
18      0050.568f.63cc    static  0          Veth56                          5
18      0050.568f.63cc    dynamic 93         Po4                             6
mc-vsm#
```

Insira o comando **show port-channel summary** para VEM # 5 para ver o canal de porta e as portas de membro:

```
mc-vsm#
mc-vsm# show port-channel summary
Flags:   D - Down          P - Up in port-channel (members)
         I - Individual    H - Hot-standby (LACP only)
         s - Suspended     r - Module-removed
         S - Switched      R - Routed
         U - Up (port-channel)
--------------------------------------------------------------------------------
Group Port-          Type     Protocol  Member Ports
      Channel
--------------------------------------------------------------------------------
1     Po1(SU)         Eth      NONE      Eth3/1(P)     Eth3/2(P)     Eth3/9(r)
                                         Eth3/10(r)
2     Po2(SU)         Eth      NONE      Eth4/1(P)     Eth4/2(P)     Eth4/9(P)
                                         Eth4/10(P)
3     Po3(SU)         Eth      NONE      Eth5/1(P)     Eth5/2(P)     Eth5/9(r)
                                         Eth5/10(r)
4     Po4(SU)         Eth      NONE      Eth6/1(P)     Eth6/2(P)     Eth6/11(P)
                                         Eth6/12(P)
```

4. Reúna detalhes adicionais do Nexus 1000V.

Insira o comando **show interface vethernet 56** para ver se Veth56 corresponde à VM (ciscolive-vm):

```
mc-vsm# show interface vethernet 56
Vethernet56 is up
  Port description is ciscolive-vm, Network Adapter 1
  Hardware: Virtual, address: 0050.568f.63cc (bia 0050.568f.63cc)
  Owner is VM "ciscolive-vm", adapter is Network Adapter 1
  Active on module 5
  VMware DVS port 3033
  Port-Profile is vApp-Network
  Port mode is access
  5 minute input rate 80 bits/second, 0 packets/second
  5 minute output rate 12552 bits/second, 8 packets/second
  Rx
    23795 Input Packets 7293075158593488853 Unicast Packets
    203449390 Multicast Packets 4294967761 Broadcast Packets
    2333878 Bytes
  Tx
    1350625 Output Packets 4768 Unicast Packets
    519692101807 Multicast Packets 4321524090 Broadcast Packets 1345857 Flood Packets
    254466737 Bytes
    0 Input Packet Drops 0 Output Packet Drops
```

Insira o comando **show interface vethernet 19** para ver se Veth19 corresponde à interface VMK (vmk0) do host:

```
mc-vsm# show interface vethernet 19
Vethernet19 is up
  Port description is VMware VMkernel, vmk0
  Hardware: Virtual, address: 0050.5667.8eb9 (bia 0050.5667.8eb9)
  Owner is VMware VMkernel, adapter is vmk0
  Active on module 5
  VMware DVS port 2110
  Port-Profile is 13
  Port mode is access
  5 minute input rate 12904 bits/second, 1 packets/second
  5 minute output rate 13384 bits/second, 8 packets/second
  Rx
    12200 Input Packets 7310589476873731518 Unicast Packets
    7310589476867241067 Multicast Packets 873444753044241742 Broadcast Packets
    16040625 Bytes
  Tx
    65549 Output Packets 3731 Unicast Packets
    141938759046 Multicast Packets 137454132371 Broadcast Packets 59221 Flood Packets
    12416427 Bytes
    8227343645136678255 Input Packet Drops 210453427045 Output Packet Drops
```

5. Verifique o pinning do tráfego da VM (ciscolive-vm) e da interface VMK (vmk0) para as interfaces upstream do host.

```
mc-vsm# module vem 5 execute vemcmd show port vsm
  LTL   VSM Port  Admin  Link  State   PC-LTL  SGID   Vem Port   Type
   6    Internal   DOWN    UP    FWD       0                        vns
   8    Internal     UP    UP    FWD       0
   9    Internal   DOWN  DOWN    FWD       0
  10    Internal   DOWN  DOWN    FWD       0      0
  11    Internal   DOWN  DOWN    FWD       0
  12    Internal   DOWN  DOWN    FWD       0      0
  14    Internal   DOWN  DOWN    FWD       0
  15    Internal   DOWN  DOWN    FWD       0
  16    Internal   DOWN  DOWN    FWD       0                        ar
  17     Eth5/1      UP    UP    FWD     305      0     vmnic0
  18     Eth5/2      UP    UP    FWD     305      1     vmnic1
  49    Veth19       UP    UP    FWD       0      1       vmk0
  50    Veth23       UP    UP    FWD       0      1   tinian-san.eth0
  51    Veth38       UP    UP    F/B*      0      0   tinian-esxi-1.eth3
  52    Veth37       UP    UP    F/B*      0      0   tinian-esxi-1.eth2
  53    Veth22       UP    UP    F/B*      0      1   tinian-esxi-1.eth1
  54    Veth21       UP    UP    F/B*      0      0   tinian-esxi-1.eth0
  55    Veth36       UP    UP    F/B*      0      1   tinian-esxi-2.eth3
  56    Veth35       UP    UP    F/B*      0      0   tinian-esxi-2.eth2
  57    Veth25       UP    UP    F/B*      0      1   tinian-esxi-2.eth1
  58    Veth24       UP    UP    F/B*      0      0   tinian-esxi-2.eth0
  59    Veth43       UP    UP    F/B*      0      1   tinian-esxi-3.eth3
  60    Veth44       UP    UP    F/B*      0      0   tinian-esxi-3.eth2
  61    Veth45       UP    UP    F/B*      0      1   tinian-esxi-3.eth1
  62    Veth46       UP    UP    F/B*      0      0   tinian-esxi-3.eth0
  63    Veth47       UP    UP    F/B*      0      1   tinian-esxi-4.eth3
  64    Veth48       UP    UP    F/B*      0      0   tinian-esxi-4.eth2
  65    Veth49       UP    UP    F/B*      0      1   tinian-esxi-4.eth1
  66    Veth50       UP    UP    F/B*      0      0   tinian-esxi-4.eth0
  67    Veth26       UP    UP    FWD       0      1   tinian-vc.eth0
  68    Veth56       UP    UP    FWD       0      0   ciscolive-vm.eth0
  69    Veth31       UP    UP    FWD       0      1   maug-vc.eth0
  75    Veth59       UP    UP    FWD       0      0   mc-ucsc.eth0
  78    Veth72       UP    UP    FWD       0      1   mc-dc-2.eth0
 305      Po3        UP    UP    FWD       0

* F/B: Port is BLOCKED on some of the vlans.
       One or more vlans are either not created or
       not in the list of allowed vlans for this port.
  Please run "vemcmd show port vlans" to see the details.
mc-vsm#
```

Esta saída mostra o mapeamento de ID de grupo de assinantes (SGID) para a VM (ciscolive-vm) e a interface VMK (vmk0) para seus controladores de interface de rede VM (VMNICs) correspondentes. O mapeamento revela quais VMNICs são usadas para comunicação:

- SGID 0 da VM (ciscolive-vm) corresponde a SGID 0 de vmnic0.
- SGID 1 da interface VMK (vmk0) corresponde ao SGID 1 de vmnic1.

6. Obtenha os endereços MAC das VMNICs do vCenter ou da interface de linha de comando

(CLI) do ESXi.

No vCenter, navegue até a marca **Configuração**:
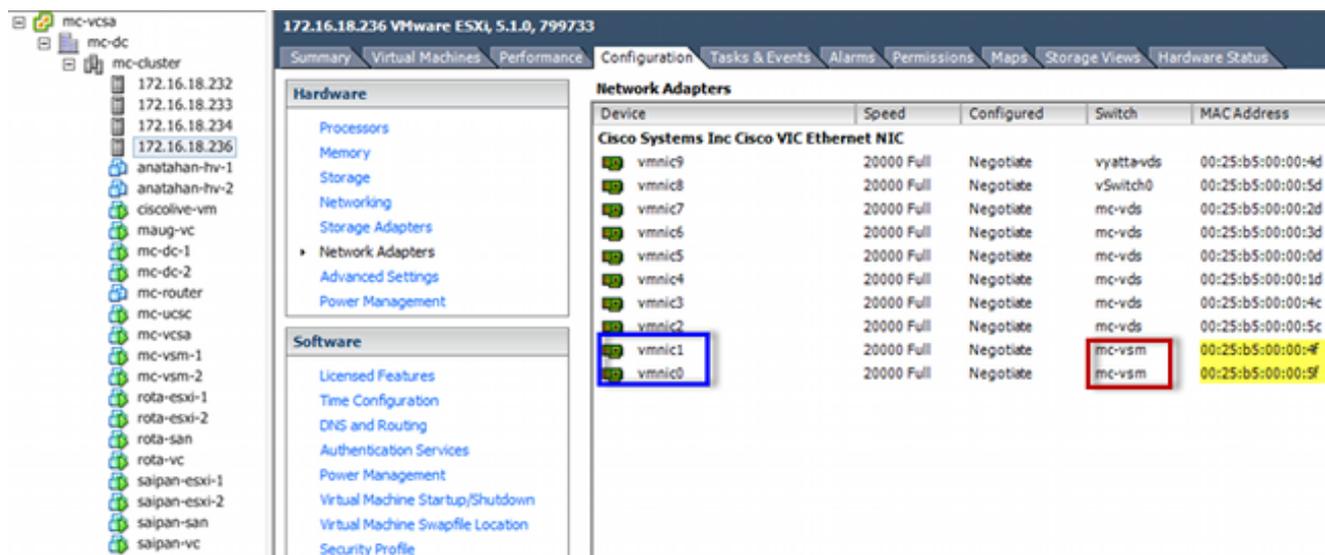
Na CLI do ESXi, insira o comando **esxcfg-nics -1**:

```
~ # esxcfg-nics -1
Name    PCI           Driver  Link Speed       Duplex MAC Address        MTU   Description
vmnic0  0000:06:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:5f 1500  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic1  0000:07:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:4f 1500  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic2  0000:08:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:5c 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic3  0000:09:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:4c 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic4  0000:0a:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:1d 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic5  0000:0b:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:0d 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic6  0000:0c:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:3d 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic7  0000:0d:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:2d 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic8  0000:0e:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:5d 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
vmnic9  0000:0f:00.00 enic    Up   20000Mbps Full   00:25:b5:00:00:4d 9000  Cisco Systems Inc Cisco VIC Ethernet NIC
```

7. No UCS Manager (UCSM), localize os controladores de interface de rede virtual (vNICs) do UCS que correspondem às VMNICs:
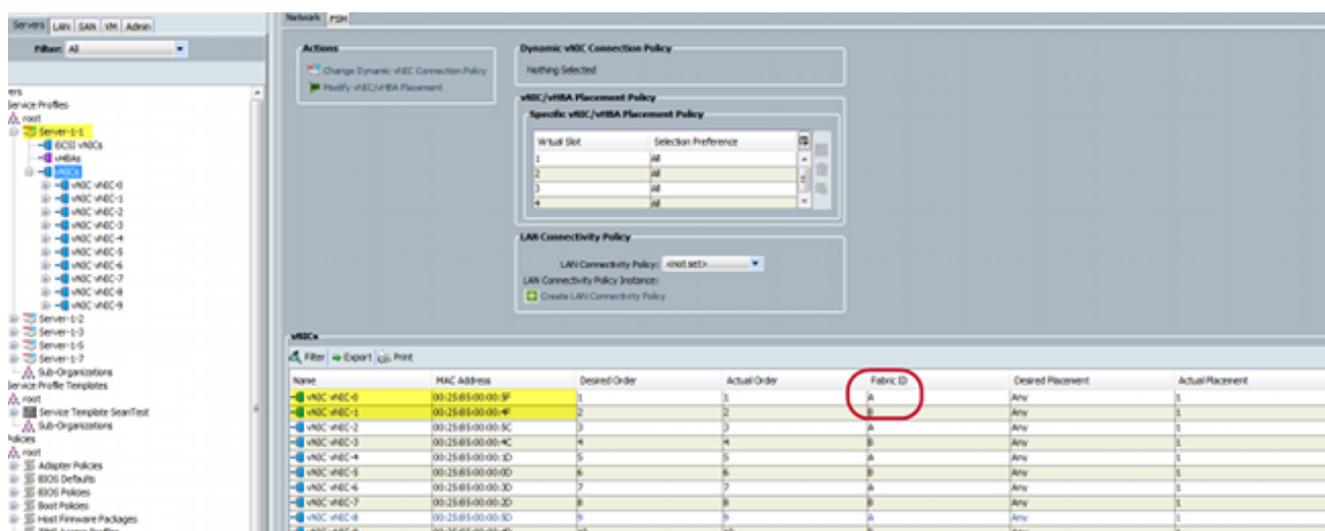
O FI primário para vNIC-0 é FI-A, enquanto o FI primário para vNIC-1 é FI-B. Agora você pode inferir que o tráfego da VM (ciscolive-vm) atravessa o FI-A e que o tráfego da interface VMK (vmk0) atravessa o FI-B.

8. Confirme se o endereço MAC da VM (ciscolive-vm) é aprendido em FI-A:

```
Mike-Cliff-Pod-16-A(nxos)# show mac address-table | in 63cc
* 18         0050.568f.63cc    dynamic   0           F    F  Veth882
Mike-Cliff-Pod-16-A(nxos)#
Mike-Cliff-Pod-16-A(nxos)# show int vethernet 882
Vethernet882 is up
    Bound Interface is port-channel1288
  Hardware: Virtual, address: 547f.eea2.5ac0 (bia 547f.eea2.5ac0)
  Description: server 1/1, VNIC vNIC-0
  Encapsulation ARPA
  Port mode is trunk
  EtherType is 0x8100
  Rx
    38196726 unicast packets  130708 multicast packets  99167 broadcast packets
    38426601 input packets  44470647026 bytes
    0 input packet drops
  Tx
    18711011 unicast packets  552876 multicast packets  10560283 broadcast packets
    29824170 output packets  9379742901 bytes
    0 flood packets
    0 output packet drops
```

9. Confirme se o endereço MAC da interface VMK (vmk0) é aprendido em FI-B:

```
Mike-Cliff-Pod-16-B(nxos)# show mac address-table | in 8eb9
* 18         0050.5667.8eb9    dynamic   0           F    F  Veth883
Mike-Cliff-Pod-16-B(nxos)#
Mike-Cliff-Pod-16-B(nxos)# show int vethernet 883
Vethernet883 is up
    Bound Interface is port-channel1287
  Hardware: Virtual, address: 547f.eea3.c7e0 (bia 547f.eea3.c7e0)
  Description: server 1/1, VNIC vNIC-1
  Encapsulation ARPA
  Port mode is trunk
  EtherType is 0x8100
  Rx
    30553743 unicast packets  94871 multicast packets  1633080 broadcast packets
    32281694 input packets  32522468006 bytes
    0 input packet drops
  Tx
    16919347 unicast packets  588794 multicast packets  8994408 broadcast packets
    26502549 output packets  8364051391 bytes
    0 flood packets
    0 output packet drops
```

10. Verifique a pinagem desses Veths para seus uplinks com o comando **show circuit detail**:

```
Mike-Cliff-Pod-16-B /org/service-profile # show circuit detail
Service Profile: Server-1-1
Server: 1/1
        Fabric ID: A
                VIF: 882
                vNIC: vNIC-0
                Link State: Up
                Oper State: Active
                State Reason:
                Admin Pin: 0/0
                Oper Pin: 0/88
                Encap: Virtual
                Transport: Ether

        Fabric ID: B
                VIF: 883
                vNIC: vNIC-1
                Link State: Up
                Oper State: Active
                State Reason:
                Admin Pin: 0/0
                Oper Pin: 0/89
                Encap: Virtual
                Transport: Ether
```

Note: Outros comandos que produzem informações semelhantes são **show pinning server-interfaces**, **show pinning border-interfaces** e **show pinning interface vethernet x**.Você também pode verificar o pinning no UCSM:

11. Colete detalhes adicionais sobre os canais de porta. Nesta configuração, há três canais de porta em uso para cada FI. Por exemplo, o FI-B tem três canais de porta associados:

- O canal de porta 89 é o canal de porta LACP (Link Aggregation Congrol Protocol) entre FI-B e o Nexus 5020 upstream.
- O canal de porta 1153 é criado automaticamente e está entre FI-B e o módulo de entrada/saída (IOM)-B.
- O canal de porta 1287 é criado automaticamente e está entre IOM-B e Cisco VIC 1240 (blade).
1. Insira o comando **show port-channel summary** para ver a configuração de canal de porta do FI-B:

```
Mike-Cliff-Pod-16-B(nxos)# show port-channel summary
Flags:  D - Down         P - Up in port-channel (members)
        I - Individual   H - Hot-standby (LACP only)
        s - Suspended    r - Module-removed
        S - Switched     R - Routed
        U - Up (port-channel)
------------------------------------------------------------------------------
Group Port-         Type       Protocol  Member Ports
      Channel
------------------------------------------------------------------------------
89    Po89(SU)      Eth        LACP      Eth1/5(P)    Eth1/6(P)
1153  Po1153(SU)    Eth        NONE      Eth1/1(P)
1287  Po1287(SU)    Eth        NONE      Eth1/1/1(P)  Eth1/1/3(P)
Mike-Cliff-Pod-16-B(nxos)#
```

2. Insira o comando **show cdp neighbors** para descobrir e visualizar informações adicionais sobre FI-B:

```
Mike-Cliff-Pod-16-B(nxos)# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute


Device-ID                  Local Intrfce Hldtme Capability  Platform      Port ID

SJ-SV-C4K-1                mgmt0          179     R S I      WS-C4506      Gig5/40
N5K-Rack16-2(FLC12110027)Eth1/5          163       S I s    N5K-C5020P-BA Eth1/22
N5K-Rack16-1(SSI1351055H)Eth1/6          157       S I s    N5K-C5020P-BF Eth1/29
mc-vsm(1981308841355189719)Eth1/1/3       160       S I s    Nexus1000V    Eth5/2
```

3. Insira o comando **show port-channel summary** para ver a configuração de canal de porta do FI-A:

```
Mike-Cliff-Pod-16-A(nxos)# show port-channel summary
Flags:  D - Down         P - Up in port-channel (members)
        I - Individual   H - Hot-standby (LACP only)
        s - Suspended    r - Module-removed
        S - Switched     R - Routed
        U - Up (port-channel)
------------------------------------------------------------------------------
Group Port-         Type       Protocol  Member Ports
      Channel
------------------------------------------------------------------------------
88    Po88(SU)      Eth        LACP      Eth1/5(P)    Eth1/6(P)
1025  Po1025(SU)    Eth        NONE      Eth1/1(P)
1288  Po1288(SU)    Eth        NONE      Eth1/1/1(P)  Eth1/1/3(P)
Mike-Cliff-Pod-16-A(nxos)#
```

4. Insira o comando **show cdp neighbors** para descobrir e visualizar informações adicionais sobre FI-A:

```
Mike-Cliff-Pod-16-A(nxos)# show cdp neighbors
Capability Codes: R - Router, T - Trans-Bridge, B - Source-Route-Bridge
                  S - Switch, H - Host, I - IGMP, r - Repeater,
                  V - VoIP-Phone, D - Remotely-Managed-Device,
                  s - Supports-STP-Dispute


Device-ID              Local Intrfce Hldtme Capability  Platform      Port ID

SJ-SV-C4K-1                mgmt0       142    R S I     WS-C4506       Gig5/39
N5K-Rack16-2(FLC12110027)Eth1/5       147     S I s    N5K-C5020P-BA  Eth1/10
N5K-Rack16-1(SSI1351055H)Eth1/6       121     S I s    N5K-C5020P-BF  Eth1/11
mc-vsm(1981308841355189719)Eth1/1/1   167     S I s      Nexus1000V   Eth5/1
```

12. Determine a pinagem específica da interface de membro do canal de porta.

Insira um comando **show port-channel** para ver se o endereço MAC FI-B - VMK(vmk0) da interface FI-B (vmk0) está conectado à Ethernet1/6 do canal de porta 89:

```
Mike-Cliff-Pod-16-B(nxos)# show port-channel load-balance forwarding-path interface port-channel 1287 vlan 18 src-mac 0050.5667.8eb9 dst-ip 172.16.18.1
Missing params will be substituted by 0's.
Load-balance Algorithm on FEX: source-dest-ip
crc8_hash: 209  Outgoing port id: Ethernet1/1/3
Param(s) used to calculate load-balance:
        dst-ip:   172.16.18.1
        src-ip:   0.0.0.0
        dst-mac:  0000.0000.0000
        src-mac:  0050.5667.8eb9
Mike-Cliff-Pod-16-B(nxos)#
Mike-Cliff-Pod-16-B(nxos)#
Mike-Cliff-Pod-16-B(nxos)# show port-channel load-balance forwarding-path interface port-channel 89 vlan 18 src-mac 0050.5667.8eb9 dst-ip 172.16.18.1
Missing params will be substituted by 0's.
Load-balance Algorithm on switch: source-dest-ip
crc8_hash: 5   Outgoing port id: Ethernet1/6
Param(s) used to calculate load-balance:
        dst-ip:   172.16.18.1
        src-ip:   0.0.0.0
        dst-mac:  0000.0000.0000
        src-mac:  0050.5667.8eb9
Mike-Cliff-Pod-16-B(nxos)#
```

Insira um comando **show port-channel** para ver se o endereço MAC FI-A - VM (ciscolive-vm) está conectado à Ethernet1/5 do canal de porta 88:

```
Mike-Cliff-Pod-16-A(nxos)#  show port-channel load-balance forwarding-path interface port-channel 1288 vlan 18 src-mac 0050.5685.63cc dst-ip 172.16.18.1
Missing params will be substituted by 0's.
Load-balance Algorithm on FEX: source-dest-ip
crc8_hash: 214  Outgoing port id: Ethernet1/1/3
Param(s) used to calculate load-balance:
        dst-ip:   172.16.18.1
        src-ip:   0.0.0.0
        dst-mac:  0000.0000.0000
        src-mac:  0050.5685.63cc
Mike-Cliff-Pod-16-A(nxos)#
Mike-Cliff-Pod-16-A(nxos)#  show port-channel load-balance forwarding-path interface port-channel 88 vlan 18 src-mac 0050.5685.63cc dst-ip 172.16.18.1
Missing params will be substituted by 0's.
Load-balance Algorithm on switch: source-dest-ip
crc8_hash: 2   Outgoing port id: Ethernet1/5
Param(s) used to calculate load-balance:
        dst-ip:   172.16.18.1
        src-ip:   0.0.0.0
        dst-mac:  0000.0000.0000
        src-mac:  0050.5685.63cc
```

13. Verifique se os endereços MAC são aprendidos no Nexus 5020 de upstream.

Insira um comando **show mac address-table** para ver se o endereço MAC da interface VMK (vmk0) é aprendido no Nexus 5020-1:

```
N5K-Rack16-1#
N5K-Rack16-1# show mac address-table | in 8eb9
* 18        0050.5667.8eb9    dynamic    10          F     F     Po89
N5K-Rack16-1#
```

Insira um comando **show mac address-table** para ver se o endereço MAC da VM (ciscolive-

vm) é aprendido no Nexus 5020-2:

```
N5K-Rack16-2#
N5K-Rack16-2# show mac address-table | in 63cc
*  18        0050.568f.63cc    dynamic    0          F     F     Po88
N5K-Rack16-2#
```

Quando você soluciona problemas de rede, este exemplo ajuda a isolar e identificar rapidamente como e onde um endereço MAC é aprendido e qual é o caminho esperado para o tráfego de rede.

Verificar

Os procedimentos de verificação estão incluídos no exemplo de configuração.

Troubleshoot

Este exemplo de configuração destina-se a ajudar na solução de problemas de rede.