

Troubleshoot Basic Networking Issues on Virtual Machines

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Introduction

This document describes how to troubleshoot basic networking connectivity issues on virtual machines.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Unified Computing System Manager Domain (UCSM)
- Cisco Unified Computing System Manager (UCSM) Command Line Interface (CLI)
- Cisco UCS B-Series and C-Series servers
- Networking basic concepts
- ESXi

Components Used

The information in this document is based on these software versions:

- Cisco UCS Manager version 2.x and later
- Cisco UCS 6200, 6300, 6400, and 6500 Series Fabric Interconnect
- Cisco UCS 2200, 2300, and 2400 Series Fabric extender I/O Module

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, ensure that you understand the potential impact of any command.

Background Information

A common scenario for infrastructure administrators deploying network or configuration changes, is to lose networking connectivity on their virtual machines. This document aims to provide guidance on the troubleshooting process to identify the most usual problems.

Understanding the Problem

The most common issue is to lose ping between virtual machines. To get the full picture, we can start asking:

- Are both virtual machines hosted in UCS servers?
- Are both virtual machines on the same UCSM Domain?
- Are the virtual machines trying to communicate on the same VLAN?
- What kind of network configuration we are using on the hypervisor side? (ESXi distributed switch, NIC teaming, and so on.)
- What is the model of the upstream switches?

Test Scenario

Two new virtual machines were provisioned and configured to use VLAN 70, however, they cannot ping each other or their default gateway.

```
[root@localhost ~]# ping 192.168.70.1
PING 192.168.70.1 (192.168.70.1) 56(84) bytes of data.
From 192.168.70.24 icmp_seq=1 Destination Host Unreachable
From 192.168.70.24 icmp_seq=2 Destination Host Unreachable
From 192.168.70.24 icmp_seq=3 Destination Host Unreachable
From 192.168.70.24 icmp_seq=4 Destination Host Unreachable
From 192.168.70.24 icmp_seq=5 Destination Host Unreachable
From 192.168.70.24 icmp_seq=6 Destination Host Unreachable
^C
--- 192.168.70.1 ping statistics ---
8 packets transmitted, 0 received, +6 errors, 100% packet loss, time 7191ms
pipe 3
[root@localhost ~]# ping 192.168.70.23
PING 192.168.70.23 (192.168.70.23) 56(84) bytes of data.
From 192.168.70.24 icmp_seq=1 Destination Host Unreachable
From 192.168.70.24 icmp_seq=2 Destination Host Unreachable
From 192.168.70.24 icmp_seq=3 Destination Host Unreachable
From 192.168.70.24 icmp_seq=4 Destination Host Unreachable
From 192.168.70.24 icmp_seq=5 Destination Host Unreachable
From 192.168.70.24 icmp_seq=6 Destination Host Unreachable
^C
--- 192.168.70.23 ping statistics ---
8 packets transmitted, 0 received, +6 errors, 100% packet loss, time 7173ms
pipe 3
```

Virtual Machines

- IMM-Transition-4.0.1
- Alma Linux 9

Hypervisor

- VMware ESXi, 7.0.3, 20842708

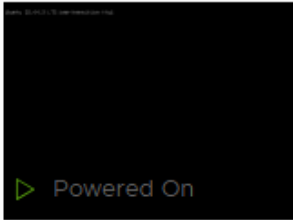
Collecting Information

MAC and IP addresses of both virtual machines:

- IMM-Transition-4.0.1
 - **MAC:** 00:50:56:ba:28:53
 - **IP:** 192.168.70.23
 - **Host IP:** 10.31.123.38

IMM-Transition-4.0.1 | | [ACTIONS](#)

[Summary](#) | [Monitor](#) | [Configure](#) | [Permissions](#) | [Datastores](#) | [Networks](#) | [Snapshots](#) | [Updates](#)



Powered On

[LAUNCH WEB CONSOLE](#)

[LAUNCH REMOTE CONSOLE](#)

Guest OS: Ubuntu Linux (64-bit)
 Compatibility: ESXi 6.0 and later (VM version 11)
 VMware Tools: Running, version:12325 (Guest Managed)

[MORE INFO](#)

DNS Name: imm-transition
 IP Addresses: 192.168.70.23
[VIEW ALL 2 IP ADDRESSES](#)

Host: 10.31.123.40


VM Hardware ^

> CPU	2 CPU(s)
> Memory	8 GB, 0.08 GB memory active
> Hard disk 1	100 GB
> Hard disk 2	100 GB
▼ Network adapter 1	
Adapter Type	VMXNET 3
MAC Address	00:50:56:ba:28:53
DirectPath I/O	Inactive
Network	vlan70 (connected)

- Alma Linux 9
 - **MAC:** 00:50:56:ba:46:96
 - **IP:** 192.168.70.24
 - **Host IP:** 10.31.123.40

Alma Linux 9 | | ACTIONS

Summary | Monitor | Configure | Permissions | Datastores | Networks | Snapshots | Updates



LAUNCH WEB CONSOLE

LAUNCH REMOTE CONSOLE

Guest OS: Red Hat Enterprise Linux 7 (64-bit)

Compatibility: ESXi 6.0 and later (VM version 11)

VMware Tools: Not running, not installed

[MORE INFO](#)

DNS Name:

IP Addresses:

Host: 10.31.123.38

VMware Tools is not installed on this virtual machine.

VM Hardware ^

>	CPU	2 CPU(s)
>	Memory	4 GB, 0.04 GB memory active
>	Hard disk 1	20 GB
∨	Network adapter 1	
	Adapter Type	VMXNET 3
	MAC Address	00:50:56:ba:46:96
	DirectPath I/O	Inactive

Tracing MAC Addresses on the FIs

FI-A # connect nxos

FI-A(nxos)# show mac address-table vlan 70

Legend:

* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC

age - seconds since last seen,+ - primary entry using vPC Peer-Link

VLAN MAC Address Type age Secure NTFY Ports/SWID.SSID.LID

-----+-----+-----+-----+-----+-----+-----

* 70 0050.56ba.4696 dynamic 30 F F Veth725 ----->>> VM Alma Linux

FI-B # connect nxos

FI-B(nxos)# show mac address-table vlan 70

Legend:

* - primary entry, G - Gateway MAC, (R) - Routed MAC, O - Overlay MAC

age - seconds since last seen,+ - primary entry using vPC Peer-Link

VLAN MAC Address Type age Secure NTFY Ports/SWID.SSID.LID

V - VoIP-Phone, D - Remotely-Managed-Device,
s - Supports-STP-Dispute

Device-ID	Local Infrfce	Hldtme	Capability	Platform	Port ID
MGMT-SWITCH	mgmt0	140	R S I	WS-C3650-12X4	Gig1/0/35
Nexus-1	Eth1/1	158	R S I s	N5K-C5672UP-1	Eth1/3
Nexus-2	Eth1/2	133	R S I s	N5K-C5672UP-1	Eth1/3

FI-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 Infrfce	Hldtme	Capability	Platform	Port ID
MGMT-SWITCH	mgmt0	139	R S I	WS-C3650-12X4	Gig1/0/36
Nexus-1	Eth1/1	167	R S I s	N5K-C5672UP-1	Eth1/4
Nexus-2	Eth1/2	132	R S I s	N5K-C5672UP-1	Eth1/4

Summary

- Virtual machine MAC addresses are learned on FI-A and FI-B respectively and VLAN 70.
- Virtual machines are hosted in different UCS servers but in the same UCSM Domain.
- Upstream switches are N5K-C5672UP-1 and connect to interfaces ethernet1-2 in both fabric interconnects.

Defining the Traffic Flow

- If source and destination are on the same subnet or VLAN, the traffic is forwarded on the same broadcast domain.
- If source and destination are on a different subnet or vlan, the traffic is forwarded into another broadcast domain.
- If source and destination are learned in the same Fabric Interconnect, the traffic is switched locally by the Fabric Interconnect.
- If source and destination are learned in a different Fabric Interconnect, the traffic is forwarded upstream.

For this particular scenario:

- Source and destination are on the same broadcast domain, but learned on different fabric interconnects, so the traffic is sent to the upstream network.

Testing only the UCS Networking

- With everything else on the UCS side configured as expected, the ping works now as the traffic is being switched locally by FI-A. Hence, the investigation needs to continue on the upstream network.

```
[root@localhost ~]# ping 192.168.70.23
PING 192.168.70.23 (192.168.70.23) 56(84) bytes of data.
64 bytes from 192.168.70.23: icmp_seq=1 ttl=64 time=1.62 ms
64 bytes from 192.168.70.23: icmp_seq=2 ttl=64 time=0.313 ms
64 bytes from 192.168.70.23: icmp_seq=3 ttl=64 time=0.457 ms
64 bytes from 192.168.70.23: icmp_seq=4 ttl=64 time=0.495 ms
64 bytes from 192.168.70.23: icmp_seq=5 ttl=64 time=0.508 ms
^C
--- 192.168.70.23 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4005ms
rtt min/avg/max/mdev = 0.313/0.677/1.616/0.474 ms
[root@localhost ~]# _
```

MAC Addresses Not Learned on the Fabric Interconnects

- Verify if the VLAN is correctly configured on the vNICs.

Modify vNIC



Name : **vnia_a0**

MAC Address

MAC Address Assignment: 00:25:B5:XX:XX:XX

[Create MAC Pool](#)

MAC Address : 00:25:B5:04:38:A0

Click [here](#) to verify if this MAC address is available.

Use vNIC Template :

[Create vNIC Template](#)

Fabric ID : Fabric A

Fabric B

Enable Failover

VLANs

VLAN Groups

Advanced Filter Export Print



Select	Name	Native VLAN	VLAN ID
<input checked="" type="checkbox"/>	470_Lab_VLAN	<input type="radio"/>	470
<input checked="" type="checkbox"/>	69_vMotion	<input type="radio"/>	69
<input checked="" type="checkbox"/>	70_vlan_for_inband	<input type="radio"/>	70
<input type="checkbox"/>	Database	<input type="radio"/>	103

CDN Source : vNIC Name User Defined

OK

Cancel

- Verify if the VLAN is correctly configured on the uplinks.

```
FI-A(nxos)# show running-config interface port-channel 1
```

```
!Command: show running-config interface port-channel1
```

```
!Time: Fri Feb 2 13:05:59 2024
```

```
version 5.0(3)N2(4.13k)
```

```
interface port-channel1
```

```
description U: Uplink
```

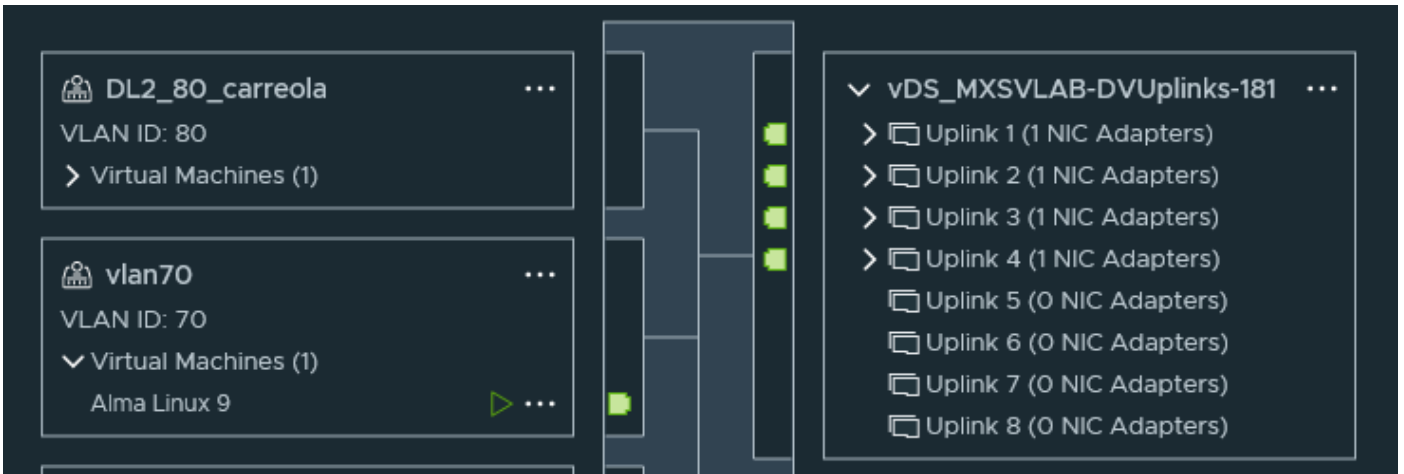
```
switchport mode trunk
```

```
pinning border
```

```
switchport trunk allowed vlan 1,69-70,72,470
```

```
speed 1000
```

- Verify if the VLAN is correctly configured on ESXi.



- Validate the vmnic used by the virtual machine on the ESXi host. Use the `esxtop` with option `n` to get the binding.

PORT-ID	USED-BY	TEAM-PNIC	DNAME	PKTTX/s	MbTX/s	PSZTX	PKTRX/s	MbRX/s	PSZRX	%DRPTX	%DRPRX
67108870	Management	n/a	vSwitch0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663306	Management	n/a	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663308	vmk0	vmnic2	DvsPortset-0	5.91	0.02	355.00	6.87	0.01	161.00	0.00	0.00
100663310	Shadow of vmnic0	n/a	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663312	Shadow of vmnic3	n/a	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663314	Shadow of vmnic2	n/a	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663316	Shadow of vmnic1	n/a	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663317	vmk1	vmnic2	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663332	2622052:LabInventoryVM.eth0	vmnic2	DvsPortset-0	0.38	0.00	133.00	1.72	0.00	105.00	0.00	0.00
100663333	2790705:PC4.eth0	vmnic2	DvsPortset-0	13.35	0.05	455.00	13.92	0.02	166.00	0.00	0.00
100663335	2821474:CENTRAL-MX.eth0	vmnic3	DvsPortset-0	0.00	0.00	0.00	0.95	0.00	64.00	0.00	0.00
100663338	2895178:nagiosxi-5.11.1-64.eth	vmnic1	DvsPortset-0	0.00	0.00	0.00	0.95	0.00	64.00	0.00	0.00
100663339	2895196:EVE_NG_CX_ACADEMY_4.et	vmnic1	DvsPortset-0	0.00	0.00	0.00	56.46	0.10	224.00	0.00	0.00
100663341	2895225:PC2.eth0	vmnic2	DvsPortset-0	1.14	0.00	91.00	1.72	0.00	97.00	0.00	0.00
100663342	2895238:CentOS7-VM-TOOLS.eth0	vmnic3	DvsPortset-0	0.00	0.00	0.00	0.95	0.00	60.00	0.00	0.00
100663343	2895247:EVE_NG_CX_ACADEMY_2.et	vmnic3	DvsPortset-0	0.00	0.00	0.00	56.46	0.10	224.00	0.00	0.00
100663344	2895250:EVE_NG_CX_ACADEMY_3.et	vmnic0	DvsPortset-0	0.00	0.00	0.00	56.46	0.10	224.00	0.00	0.00
100663345	2896082:FVF_NG_CX_ACADEMY_1.et	vmnic0	DvsPortset-0	0.00	0.00	0.00	56.46	0.10	224.00	0.00	0.00
100663347	3080592:Alma Linux 9.eth0	vmnic1	DvsPortset-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100663348	3137650:IMM-Transition-4.0.1.e	vmnic2	DvsPortset-0	1.34	0.00	75.00	0.95	0.00	64.00	0.00	0.00
2248146957	vmnic0	-	DvsPortset-0	0.00	0.00	0.00	3.81	0.00	106.00	0.00	0.00
2248146959	vmnic3	-	DvsPortset-0	0.00	0.00	0.00	3.81	0.00	106.00	0.00	0.00
2248146961	vmnic2	-	DvsPortset-0	18.69	0.06	395.00	21.93	0.02	134.00	0.00	0.00
2248146963	vmnic1	-	DvsPortset-0	0.00	0.00	0.00	3.81	0.00	106.00	0.00	0.00

- Virtual machines are using vmnic1 and vmnic2 on host 1/3.
- Mapping MAC addresses from ESXi vmnics to UCS vNICs

```
[root@esx38:~] esxcfg-nics -l
```

```
Name PCI Driver Link Speed Duplex MAC Address MTU Description
```

```
vmnic0 0000:06:00.0 nenic Up 20000Mbps Full 00:25:b5:04:38:a0 9000 Cisco Systems Inc Cisco VIC Ethernet
vmnic1 0000:07:00.0 nenic Up 20000Mbps Full 00:25:b5:04:38:a1 9000 Cisco Systems Inc Cisco VIC Ethernet
vmnic2 0000:08:00.0 nenic Up 20000Mbps Full 00:25:b5:04:38:b0 9000 Cisco Systems Inc Cisco VIC Ethernet
vmnic3 0000:09:00.0 nenic Up 20000Mbps Full 00:25:b5:04:38:b1 9000 Cisco Systems Inc Cisco VIC Ethernet
```

Equipment / Chassis / Chassis 1 / Servers / Server 3

Equipment / Chassis / Chassis 1 / Servers / Server 3							
General Inventory Virtual Machines Installed Firmware CIMC Sessions SEL Logs VIF Paths Health Diagnostics Faults Events FSM Statistics Temperatures Power							
Motherboard CIMC CPUs GPUs Memory Adapters HBAS NICs iSCSI vNICs Security Storage Persistent Memory							
+ - Advanced Filter Export Print							
Name	vNIC	Vendor	PID	Model	Operability	MAC	Original MAC
▶ NIC 1	vnia_b0	Cisco Systems Inc	UCSB-MLOM-40G-01	Cisco UCS VIC 1240	Operable	00:25:B5:04:38:A0	00:00:00:00:00:00
▶ NIC 2	vnic_b1	Cisco Systems Inc	UCSB-MLOM-40G-01	Cisco UCS VIC 1240	Operable	00:25:B5:04:38:A1	00:00:00:00:00:00
▶ NIC 3	vnic_b0	Cisco Systems Inc	UCSB-MLOM-40G-01	Cisco UCS VIC 1240	Operable	00:25:B5:04:38:B0	00:00:00:00:00:00
▶ NIC 4	vnic_b1	Cisco Systems Inc	UCSB-MLOM-40G-01	Cisco UCS VIC 1240	Operable	00:25:B5:04:38:B1	00:00:00:00:00:00

- Is the OS forwarding the frame? (Confirm with a packet capture.)
- VIC adapter
- IOM (HIFs and NIFs)

Related Information

- [Cisco Technical Support & Downloads](#)