Troubleshoot IMM Network on UCS Domain with API Explorer and NXOS

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Introduction

This document describes the analysis of network connectivity or life of the packet for a Unified Computing System (UCS) Domain in Intersight Managed Mode and identifies the internal connection for servers with the API Explorer and NXOS commands.

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Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Intersight
- Physical Network Connectivity
- Application Programming Interface (API)

Components used

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

- Cisco UCS 6454 Fabric Interconnect, firmware 4.2(1e)
- UCSB-B200-M5 blade server, firmware 4.2(1a)
- Intersight software as a service (SaaS)

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

The connection between Fabric interconnects and Virtual Network Interface (vNICs) is established through virtual circuits, called Virtual Interface (VIF). Such VIF's are pinned to uplinks and allow communication with the upstream network

In Intersight Managed Mode there is no command that maps the virtual interfaces with each server such as **show service-profile circuit**. API Explorer/NXOS commands can be used in order to determine the relationship of the internal circuits created within the UCS domain.

API Explorer

API explorer is available from the Graphical User Interface (GUI) of either of the fabric interconnects (primary or subordinate). Once logged into the console, navigate to Inventory, select the server and then click on Launch API Explorer.



The API Explorer contains an API Reference, which lists the available calls. It also includes a representational state transfer (REST) Client interface to test API calls.

cisco API EXPLORER	UCS-T	S-MXC-P25-8454-IMM-1-1 (Server) Guides API Reference			Ŀ
API Reference v2019.2	۵	aer	REST Client	REST Client	
Q Search		Response Model		GET /redfish/v1/AccountService	
AccountService	~				1
GET AccountService		@odata.context: string (Read Only) The OData description of a payload.		Send	
PATCH AccountService		Grodata.etag: string (Read Only) The current ETag of the resource.		Record Red. Record Info	
PUT AccountService	- 1	Godata.id: string (Read Only) The unique identifier for a resource.		Hesponse text Hesponse Into	
AccountService/Accounts	~	Godata.type: string (Read Only) The type of a resource.		1	
AccountService/ActiveDirectory/Certi	~	AccountLookoutCounterResetMter: integer The period of time, in seconds, between the last failed login attempt and the reset of the lockout the counter. This value must be less than or equal to the AccountLockoutDuration value. A reset sets to 0:	eshold e counter to		
AccountService/ExternalAccountPro	~		ownime H		
AccountService/LDAP/Certificates	~	True', it is rest. If its or only control to the service of t	aches the rator-issued		
AccountService/Roles	~	reset clears the threshold counter. If this property is absent, the default is 'true'.			
CertificateService	~	AccountLockoutDuration: Integer The period of time, in seconds, that an account is locked after the number of failed login attempts reaches the lockout threshold, whin the period between the last failed login attempts and the reset of the lockout method, this use is 10° on below will now if the decount of other account failed methods in 10° the integer that one of the lockout methods.	account counter. If		
CertificateService/Actions/Certificate	~	inte value is 0, no locatori wii occur, il me Accounticoatoricounterresellichabed value is laise, ins prope	y is ignored.		
CertificateService/Actions/Certificate	~	Account_bokaut heresheld: integer i the number of allowed taxed login attempts before a user account is locked for a specified duration. If U, to never locked.	e account is		
CertificateService/CertificateLocations	~	Accounts: object			
Chassis	~	Bodata.id: string (Read Only) The unique identifier for a resource.			

Identify VIF through API calls

You can use a set of API calls to determine which VIF corresponds to each virtual vNIC. This allows you to troubleshoot NXOS more effectively.

For the purpose of this document, navigation with API calls is done through these items: Chassis, Server, Network Adapter, vNIC/vHBA.

API Call GET Chassis ID

GET Adapter ID

GET Network details (list of vnics/vhbas)

GET Network device functions (vNIC configuration)

Syntax /redfish/v1/Chassis /redfish/v1/Chassis/{ChassisId}/NetworkAd apters /redfish/v1/Chassis/{ChassisId}/NetworkAd apters/{NetworkAdapterId} /redfish/v1/Chassis/{ChassisId}/NetworkAd apters/{NetworkAdapterId}/NetworkDeviceF unctions

Retrieve Chassis ID

cisco API EXPLORER	UCS-TS	S-MXC-P25-6454-IMM-1-1 (Server)	Suides API Referer	nce	G
API Reference v2019.2	Θ	GET	REST Client	REST Client	
Q Search		Response Model		GET /redfish/v1/Chassis	
AccountService	- I				
AccountService/Accounts	~	Godata.context: string (Read Only) The OData description of a payload.		Send 200 Success	
AccountService/ActiveDirectory/Certi	~	@odata.etag: string (Read Only) The current ETag of the resource.		Response Text Response Info	
AccountService/ExternalAccountPro	~	@odata.id: string (Read Only) The unique identifier for a resource.			
AccountService/LDAP/Certificates	~	@odata.type: string (Read Only) The type of a resource.		1 🧃 2 "@odata.context": "/redfish/v1/\$metadata#ChassisCollection.ChassisColle	cti
AccountService/Roles	~	Description: string The description of this resource. Used for commonality in tr definitions.	he schema	3 "@odata.id": "/redfish/vl/Chassis", 4 "@odata.type": "#ChassisCollection. ChassisCollection", """""""""""""""""""""""""""""""""""	
CertificateService	~	Members: object (Read Only) The members of this collection.		6 "Members": [
CertificateService/Actions/Certificate	~	@odata.id: string (Read Only) The unique identifier for a resource.		8 "@odata.id": "/redfish/v1/Chassis/FLM2402001F" 9 }.	
Post CertificateService/Actions	teCS	Members@odata.count: integer (Read Only) The number of Items in a collect	stion.	10 { 11 "@odata.id": "/redfish/v1/Chassis/1"	
CertificateService/Actions/Certificate	~	Members@odata.nextLink: string (Read Only) The URI to the resource cont next set of partial members.	sining the	12 } 13],	
Post CertificateService/Actions /CertificateService.Replace ficate	Certi	Name: string The name of the resource or array member.		14 "Menersyodata.count": 2, 15 "Nane": "Chassis Collection" 16 D	
CertificateService/CertificateLocations	^	Dem: object			

/redfish/v1/Chassis/FLM2402001F Retrieve the network adapter ID



Copy the Network ID for the next API call.

/redfish/v1/Chassis/FLM2402001F/NetworkAdapters/UCSB-MLOM-40G-04_FCH23527C67 Retrieve vNIC ID

cisco API EXPLORER UCS-T	S-MXC-P25-6454-IMM-1-1 (Server)	Guides API Reference	G
API Reference v2019.2	REST Client	REST Client	
Q Search	Parameters Response Model	GET /redfish/v1/Chassis/(Chassis/d)NetworkAdapters/(NetworkAdapterid)	
Chassis(Chassis(s)Chrises Chassis(Chassis(s)Chrines Chassis(Chassis(s)Chrines Chassis(Chassis(s)Chrines	Personnes Personnes Model Chassisid (string) puth The value of the ld property of the Chassis resource Network-Adapterid (string) puth The value of the ld property of the Network-Adapterid (string) puth The value of the ld property of the Network-Adapterid (string) puth	GET /redish/1/Chassis/D/Metwork/dapters/UCSB-HL0H-486-44_FOR3527667/ketwork/dapter.pt: "#Retwork/dapter.stop:" impostat.id": "/redish/1/Chassis/FUX24220017/ketwork/dapters/UCSB-HL0H-486-64_FOR3527667/ketwork/dapter.ResetSettingsToDefault" impostat.id": "/redish/1/Chassis/FUX24220017/ketwork/dapters/UCSB-HL0H-486-64_FOR3527667/ketwork/dapter.ResetSettingsToDefault" impostat.id": "/redish/1/Chassis/FUX24220017/ketwork/dapters/UCSB-HL0H-486-64_FOR3527667/ketwork/dapter.ResetSettingsToDefault" impostation/substring/substri	
Network/Adapters /Network/Adapters/ /Network/Adapters/ /Network/DeviceFunctions /Network/DeviceFunctionId) /Ethernet/VLANs		38 "@odata.id": "/redfish/v1/Chassis/FU/2402001F/NetworkAdapters/UCSB-HLOM-406-04_FCH23527667/NetworkPorts/Port-2" 39 } 40 1, 41 "NetworkPortsModata.count": 2	

Copy the Network adapter(s) ID.

```
/redfish/v1/Chassis/FLM2402001F/NetworkAdapters/UCSB-MLOM-40G-
04_FCH23527C67/NetworkDeviceFunctions/Vnic-A
/redfish/v1/Chassis/FLM2402001F/NetworkAdapters/UCSB-MLOM-40G-
04_FCH23527C67/NetworkDeviceFunctions/Vnic-B
```

Retrieve the VIF ID of the corresponding vNIC



In this case, vNIC-A is mapped to **VIF 800**. From here, NXOS commands contain this virtual interface.

Identifying VIF with NXOS and Grep Filters

If API Explorer is not available, or you have no access to the GUI, CLI commands can be used to retrieve VIF information.

Note: You must know the Server Profile in order to use these commands.

```
UCS-TS-MXC-P25-6454-IMM-A(nx-os) # show run interface | grep prev 1 IMM-Server-1
switchport trunk allowed vsan 1
switchport description SP IMM-Server-1, vHBA vhba-a, Blade:FLM2402001F
- -
interface Vethernet800
description SP IMM-Server-1, vNIC Vnic-A, Blade:FLM2402001F
interface Vethernet803
description SP IMM-Server-1, vNIC Vnic-b, Blade:FLM2402001F
_ _
interface Vethernet804
description SP IMM-Server-1, vHBA vhba-a, Blade:FLM2402001F
Command Syntax
                                                          Use
                                                          Lists Vethernets associated with each
show run interface | grep prev 1 <server profile name>
                                                          vNIC/vHBA
show run interface | grep prev 1 next 10 <server profile
                                                          Lists detailed Vethernet configuration
name>
```

NXOS Troubleshoot

Once the vNIC has been mapped to the correspondent Vethernet, analysis can be done on NXOS with the same commands used to troubleshoot physical interfaces.

Notation for vNICs is veth - Vethernet.

show interface brief shows Veth800 in downstate with ENM Source Pin Failure as the reason.

UCS-TS-MXC-P25-6454-IMM-A# connect nxos UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show interface brief | grep -i Veth800 Veth800 1 virt trunk down ENM Source Pin Fail auto **show interface** shows Vethernet 800 is in an **initializing** state.

UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show interface Vethernet 800 Vethernet800 is down (initializing) Port description is SP IMM-Server-1, vNIC Vnic-A, Blade:FLM2402001F Hardware is Virtual, address is 0000.abcd.dcba Port mode is trunk Speed is auto-speed Duplex mode is auto 300 seconds input rate 0 bits/sec, 0 packets/sec 300 seconds output rate 0 bits/sec, 0 packets/sec Rx 0 unicast packets 0 multicast packets 0 broadcast packets 0 input packets 0 bytes 0 input packet drops Tx 0 unicast packets 0 multicast packets 0 broadcast packets 0 output packets 0 bytes 0 flood packets 0 output packet drops UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show running-config interface Vethernet 800 !Command: show running-config interface Vethernet800 !Running configuration last done at: Mon Sep 27 16:03:46 2021 !Time: Tue Sep 28 14:35:22 2021 version 9.3(5)I42(1e) Bios:version 05.42 interface Vethernet800 description SP IMM-Server-1, vNIC Vnic-A, Blade:FLM2402001F no 11dp transmit no 11dp receive no pinning server sticky pinning server pinning-failure link-down no cdp enable switchport mode trunk switchport trunk allowed vlan 1,470 hardware vethernet mac filtering per-vlan bind interface port-channel1280 channel 800 service-policy type gos input default-IMM-QOS no shutdown

A VIF needs to be pinned to an uplink interface, in this scenario **show pinning border interface** does not display the Vethernet pinned to any uplink.

UCS-TS-MXC-P25-6454-IMM-B(nx-os)# show running-config interface ethernet 1/45 !Command: show running-config interface Ethernet1/45 !No configuration change since last restart !Time: Wed Sep 29 05:15:21 2021 version 9.3(5)I42(1e) Bios:version 05.42 interface Ethernet1/45 description Uplink pinning border switchport mode trunk switchport trunk allowed vlan 69,470 no shutdown **show mac address-table** details that Veth800 uses VLAN 1 which is not present on the uplinks.

On a UCS Domain, the VLAN in use must be included on the vNIC and the uplinks as well. VLAN policy configures the VLANs on the fabric interconnects. The image shows the configuration of this UCS domain.

≡	cisco Intersight		CONFIGURE > Policies > vlans-IMM						۵ 🖬 🕰 🖌	272 🕑	দ‡ 32 🔍 🎯 💿	Luis Uribe Rojas 🔬
<u>ulo</u>												Edit Policy
Ŷ			Details	Usage							Configuration	
	Servers Chassis Fabric Interconnects	n Name vfansdMM is Description - Intecconnects Usage 4			4 items found 10 v per page I 1 01 I 0 0 4 Add Filter 0 0 Add Filter 0 Name 1 10 v Platform Type Type 1 0 0 10 <th10< th=""> 10 <th10< th=""> 10<th>VLAN ID 69 Name / Prefix Multicast Auto Allow On Uplinks</th><th></th></th10<></th10<>				VLAN ID 69 Name / Prefix Multicast Auto Allow On Uplinks			
	Pryperniex Glusters		Last Update Jul 19, 2021 5:43 PM			⊙ 0К	UCS Domain	Profile		Aug 24, 2021 6:2		
1 4	storage		Organization default				UCS Domain	Profile		Aug 24, 2021 6:2	VLAN ID 470	
~	Orchestration		Tags Set				UCS Domain UCS Domain	Profile Profile		Jul 27, 2021 8:1 Jul 27, 2021 8:1	Name / Prefix Multicast Auto Allow On Uplinks	VLAN_470 multicast-IMM Yes
	Templates										Native VLAN ID	
	Policies											
1957	Pools											
ক্র	Tagata											
	Targets Software Repository											

VLAN 1 is not present on the policy so it must be added.

Select **Edit Policy** in order to allow connectivity. This change requires the deployment of the UCS Domain Profile.

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		This policy is applicable only for UCS Domains							
×									
		This policy is associated with Profile(s). Redeploy the associated profile(s) for these changes to take effect.							
		Cancel							
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=	cisco Intersight	CONFIGURE > Profiles		¢	🖬 313 🔺 272 🛛 🗹	ç \$ 32 ♀ ④	Luis Uribe Re	ojas &
<u>00</u> 0	MONITOR	HyperFlex Cluster Profiles UCS Chassis Profiles UCS Do	main Profiles UCS Server Profiles				Create UCS Domain P	rofile
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	HyperFlex Clusters					2 hours ago		
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×	CONFIGURE						Unassign	
	Orchestration						Edit	
	Profiles						Clone	
	Templates							
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	Targets							
	Software Repository							

VLAN assignment can be verified by CLI:

UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show running-config interface ethernet 1/45 !Command: show running-config interface Ethernet1/45 !Running configuration last done at: Wed Sep 29 07:50:43 2021 !Time: Wed Sep 29 07:59:31 2021 version 9.3(5)I42(1e) Bios:version 05.42 interface Ethernet1/45 description Uplink pinning border switchport mode trunk switchport trunk allowed vlan 1,69,470 udld disable no shutdown UCS-TS-MXC-P25-6454-IMM-A(nx-os)#

Now that the necessary VLAN(s) is added, the same set of commands can be used in order to verify connectivity on Vethernet800:

UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show interface brief | grep -i Veth800 Veth800 1 virt trunk up none auto UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show interface Vethernet 800 Vethernet800 is up Port description is SP IMM-Server-1, vNIC Vnic-A, Blade:FLM2402001F Hardware is Virtual, address is 0000.abcd.dcba Port mode is trunk Speed is auto-speed Duplex mode is auto 300 seconds input rate 0 bits/sec, 0 packets/sec 300 seconds output rate 0 bits/sec, 0 packets/sec Rx 0 unicast packets 1 multicast packets 6 broadcast packets 7 input packets 438 bytes 0 input packet drops Tx 0 unicast packets 25123 multicast packets 137089 broadcast packets 162212 output packets 11013203 bytes 0 flood packets 0 output packet drops UCS-TS-MXC-P25-6454-IMM-A(nx-os)# show runningconfig interface Vethernet 800 !Command: show running-config interface Vethernet800 !Running configuration last done at: Wed Sep 29 07:50:43 2021 !Time: Wed Sep 29 07:55:51 2021 version 9.3(5)I42(1e) Bios:version 05.42 interface Vethernet800 description SP IMM-Server-1, vNIC Vnic-A, Blade:FLM2402001F no lldp transmit no lldp receive no pinning server sticky pinning server pinning-failure link-down switchport mode trunk switchport trunk allowed vlan 1,69,470 hardware vethernet mac filtering per-vlan bind interface port-channel1280 channel 800 service-policy type qos input default-IMM-QOS no shutdown

Veth800 is listed on the pinned interfaces to the uplink Ethernet interfaces:

VIFs are now ready to transmit traffic to the upstream network.

Related Information

- Domain Profiles in Intersight
- Server Profiles in Intersight
- Domain Policies in Intersight
- <u>Technical Support & Documentation Cisco Systems</u>