Configure VNIC Tuning on Intersight Managed Mode

Contents

Introduction Prerequisites Requirements Components used Configure Verify Validate the adapter settings on RHEL. Validate the adapter settings on VMware ESXi. Validate the adapter settings directly on UCS. Related Information

Introduction

This document describes the fine-tuning options for the VNIC adapters in Intersight Managed Mode (IMM) through the server profiles.

Prerequisites

OS recommended settings for ethernet adapters:

Operational Compute, Storage, and Management Policies must be configured beforehand.

Requirements

Cisco recommends that you have knowledge of these topics:

- Intersight Managed Mode
- Physical Network Connectivity
- OS recommended ethernet adapter settings
- VNIC fine-tuning elements

Components used

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

- UCS-B200-M5 firmware 4.2(1a)
- Cisco UCS 6454 Fabric Interconnect, firmware 4.2(1e)
- 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.

Configure

Step 1. Identify VIC Adapter and Slot ID on the server

Navigate to the **Servers** tab > **Inventory** > Select the **Network Adapters** option.

OPERATE > Servers > UCS-TS-MXC		🗘 🖬 370 🔺	348 🗹 🥵 34 🥬	₽, ⊗ ⊙	ደ			
General Inventory UCS Server Profile HCL Statistics								Actions 🗸
Expand All	Adapter UCSB-MLOM-40G-04_FCH240170RW	1						
Motherboard Boot	General Interfaces							
Management Controller	Alarms				Hardware			
CPUs Memory Notent t destreme	Critical		Info		Adapter ID	UCSB-MLOM-40G- 04. FCH240170RW	Part Number	73-19235-02
Adapter UCSB-MLOM-40G-	Warning	A 0			Connection	PCI Slot SlotID:0(MLOM)	Serial	
Storage Controllers	Configuration				Model	UCSB-MLOM-40G-04	Vendor	Actions > 73-19235-02 Cisco Systems Inc
	Firmware Version	5.2(1a)						
	Interfaces							
	DCE Interfaces NIC Interfaces		HBA Interfaces					

Step 2. Create Ethernet Adapter policy

Create the Ethernet Adapter policy with the suggested values by the OS Vendor.

Navigate to **Policies** tab > **Create Policy** > Select **Ethernet Adapter**.

Select Policy Type

Filters	Q Search	
PLATFORM TYPE	Adapter Configuration	C Local User
All	◯ Add-ons	O Multicast
O UCS Server	 Auto Support 	Network CIDR
O UCS Domain	Backup Configuration	Network Configuration
O UCS Chassis) BIOS	Network Connectivity
HyperFlex Cluster	O Boot Order	O Node IP Ranges
Kubernetes Cluster	Certificate Management	Node OS Configuration
	O Container Runtime	
	O Device Connector	Persistent Memory
	DNS, NTP and Timezone	⊖ Port
	Ethernet Adapter	O Power
	Ethernet Network	Replication Network Configuration
	Ethernet Network Control	SAN Connectivity
	Ethernet Network Group	◯ SD Card
	C Ethernet QoS	O Security
	External FC Storage	Serial Over LAN
	External iSCSI Storage	⊖ SMTP
	○ FC Zone	
	Fibre Channel Adapter	

Once within the Create Policy menu, select the Organization and provide the Policy Name.

CONFIGURE > Policies > Ethernet Adapter > Create	다 🖪 331 🔺 349 🕑 약취 344 오, 🐼 🕥
General 2 Policy Details	Step 1 General Add a name, description and tag for the policy. Organization * default
	Set Tags Description Recommended settings for RHEL <

Step 3. Configure the suggested settings by the OS vendor. Usually, the listed features are configured within the Ethernet Adapter Policy:

- Receive Queues
- Transmit Queues
- Ring Size
- Completion Queues
- Interrupts
- Enable Receive Side Scaling (RSS) or Accelerated Receive Flow Steering (ARFS)

Note: RSS and ARFS are mutually exclusive so configure only one. Do not configure both.

≡	cisco Intersight	t	CONFIGURE > Policies > Ethern	net Adapter > Cre	ate		💭 📕 331 🔺 349		34 9, @	
<u>00</u> 0	MONITOR	Â	⊆ Progress		Interrupt Settings					
Ŷ	OPERATE ^	、			Interrupts 18	ە ()	Interrupt Mode MSIX	~ ©	Interrupt Timer, us 125	
	Servers		General			1 - 1024				
	Chassis		2 Policy Details		Interrupt Coalescing Type Min					
	Fabric Interconnects									
	Networking				Receive					
	Heriorang				Receive Queue Count		Receive Ring Size			
	HyperFlex Clusters				8	<u> </u>	4096	<u> </u>		
	Integrated Systems					1 - 1000		64 - 16384		
2	CONFIGURE				Transmit					
	CONTROLL .				Transmit Queue Count	A .	Transmit Ring Size	A .		
	Orchestration				8	1 - 1000	4090	64 - 16384		
	Profiles				Completion					
	Templates				Completion Queue Count		Completion Ring Size			
	Policies				16	0	1	0		
		н			Helel, Falls and Theory of Assessed	1-2000		1 - 250		
	Pools				5	0 0				
ø	ADMIN ^	、				0 - 600				
	Targets				TCP Offload					

Once created, assign the Ethernet Adapter Policy to a LAN Connectivity Policy.

Step 4. Create LAN Connectivity Policy

Navigate to the **Policies** tab > **Create Policy** > **LAN Connectivity**

≡	cisco Intersight	CONFIGURE > Policies > Create		🗘 🗷 331 🔺	349 🖸 😝 34 🔍 😳 🤅
<u>00o</u>	MONITOR				
9	OPERATE ^			Select Policy Type	
	Servers		Filters	Q. Search	
	Chassis	-			
	Fabric Interconnects				
	Networking			Http Proxy Policy	System QoS
	HyperFlex Clusters		UCS Domain	IMC Access) Thermal
	Integrated Systems		UCS Chassis	IPMI Over LAN	Trusted Certificate Authorities
×	CONFIGURE ^		HyperFlex Cluster	O ISCSI Adapter	UCSM Configuration
	Orchestration		Kubernetes Cluster	O ISCSI Boot	⊖ vCenter
	Profiles			ISCSI Static Target	Virtual KVM
	Templates			C Kubernetes Version	Virtual Machine Infra Config
	Policies			LAN Connectivity	Virtual Machine Instance Type
	Pools				Virtual Media
ത				Link Aggregation	
4	Targets				V VSAN

Select the Organization and provide the Policy Name.

Under target, the platform selects UCS Server (FI-Attached).

≡	cisco Intersight	CONFIGURE > Policies > LAN Connectivity > Create	🗘 🖪 369 🔺 348 🕑 📢 34 ପ୍ୱ
<u>00o</u>	MONITOR	⊂ Progress	Step 1
Ŷ	OPERATE ^	General General	General Add a name, description and tag for the policy.
	Servers		~ ~ ~~
	Chassis	Z Policy Details	Organization *
	Fabric Interconnects		default <u>v</u>
	Networking		
	HyperFlex Clusters		RHEL_LAN_CP
	Integrated Systems		Target Platform 💿
×	CONFIGURE ^		UCS Server (Standalone) UCS Server (FI-Attached)
	Orchestration		Set Tags
	Profiles		
	Templates		Description
	Policies		
	Pools		

Within the LAN Connectivity policy, navigate to the **vNIC Configuration** section and configure at least two network interfaces. In this example, eth0 and eth1 interfaces are created.

On the Add vNIC configuration tab, under General, provide the name eth0.

Under the MAC Address section, select the appropriate MAC Address Pool.

Under the **Placement** section, configure the **Slot ID** as **MLOM**.

Leave the PCI Link and PCI Order options with value 0 and Switch ID with option A.

	Add vNIC	
General		
Name * eth0	© Pin Group Name	~ 0
MAC Address		
Pool Static MAC Address Pool * Selected Pool MAC-IMM-POOL © ×		
Placement		
Slot ID * MLOM	PCI Link © 0	<u>()</u> 0 0-1
Switch ID * A	<u>~ 0</u>	

Navigate to the **Consistent Device Naming (CDN)** menu, and select **VNIC Name**.

Add the Ethernet Network Group Policy, Ethernet Network Control Policy, Ethernet QoS, and Ethernet Adapter policies.

Consistent Device Naming (CDN)	
Source vNIC Name v 0	
Failover	
○ Enabled ⊙	
Ethernet Network Group Policy * ①	
Selected Policy IMM-Ethernet 💿 ×	
Ethernet Network Control Policy * ①	
Selected Policy IMM_policy ③ ×	
Ethernet QoS * O	
Selected Policy UCSC-veth-qos-policy1 ③ ×	
Ethernet Adapter * 💿	
Selected Policy RHEL_Eth_Adapter_Policy ③ ×	
iSCSI Boot ①	
Select Policy 🗐	

Repeat the same steps to create the interface **eth1**, configure the **PCI Link**, **PCI Order** and **Switch ID** values accordingly.

≡	cisco Intersight	CONFIGURE > Policies > LAN Connectivity > Create				۵ ه	369 🔺 348	₽ 6 3	34 Q	0	
<u>00o</u>	MONITOR	☑ Progress	IUN								
Ŷ	OPERATE ^	(1) General		None	Pool		Static				
	Servers	Ĭ									
	Chassis	Policy Details	•	This option ensures	s the IQN name is n	ot associated with	n the policy				
	Fabric Interconnects		VNIC C	configuration							
	Networking										
	HyperFlex Clusters			Manual vNICs	Placement	Au	to vNICs Placement				
	Integrated Systems		0	For manual placem	ent option you nee	d to specify placer	ment for each vNIC.	Learn more at He	lp Center		
×	CONFIGURE ^										
	Orchestration		-	Add VNIC						Graphic vNIC	s Editor
	Profiles										
	Templates										O
				Name	Slot ID	Switch ID	PCI Link	PCI Order	Failover	Pin Group	
	Policies			eth0	MLOM				Disabled		
	Pools			eth1	MLOM	в			Disabled		
ē	ADMIN ^										
	Targets										

Finally, create the LAN Connectivity Policy. Once created, assign it to a UCS Server Profile.

Step 5. Create a Server profile.

Navigate to the **Profiles** tab, and then select **Create UCS Server Profile**.

Provide the **Organization** and **Name** details.

≡	رابیان Intersight	CONFIGURE > Create UCS Server Profile	Q 🖪 369 🔺 348 🕑 🛛 ⊄ 34 🔍 🔅
<u>000</u> M		▲ Progress	Step 1
@ 0	OPERATE ^	1 General	Enter a name, description, tag and select a platform
c	Servers Chassis	2 Server Assignment	for the server profile.
Fa	abric Interconnects	3 Compute Configuration	Iefault ×
N	letworking	4 Management Configuration	lame*
н	HyperFlex Clusters	5 Storage Configuration	©
In	ntegrated Systems	6 Network Configuration	arget Platform O
× °	CONFIGURE ^	7 Summary	UCS Server (Standalone) 💿 UCS Server (FI-Attached)
0	Orchestration		
P	Profiles		et lags
т	remplates		
P	Policies	C	Description
P	Pools	-	

Select all the related configurations such as Compute, Management, and Storage settings.

Under Network configuration, select the appropriate LAN Connectivity policy.

≡	cisco Intersight		CONFIGURE > Edit UCS Server Pro	le (RHEL_Server_Profile) 🗘 🖪 3	329 🔺 348 🛛 🖓 🕼 🖓
<u>00o</u>	MONITOR	î	🔄 Progress	Step 4	
Ŷ	OPERATE ^	L	1 General	Creat	twork Configuration te or select existing Network Configuration te that way want to exercise with this config
	Chassis	L	2 Server Assignment		
	Fabric Interconnects	L	3 Compute Configuration	Adapter Configuration	
	Networking	L	4 Management Configuration	LAN Connectivity	
	HyperFlex Clusters	L	5 Storage Configuration	SAN Connectivity	
	Integrated Systems	L	Network Configuration	Auto Placement Configuration for vNICs & vHBAs	
×	CONFIGURE ^	L		Graphical representation of vNICs & vHBAs placement is only	y applicable for Auto Configuration mode.
	Orchestration	L	Summary		
	Profiles	L			
	Templates	L			≣®
	Policies	L		No vNICs & Assign server and attach LAN,	vHBAs Placement Available VSAN connectivity policies to view representation
	Pools				
ģ	ADMIN ^				
	Targets				

	Step 6 Network Configuration Create or select existing Network Configuration policies that you want to associate with this profile.		
Adapter Configuration			
LAN Connectivity		RHEL_LAN_CP	1
SAN Connectivity			
Auto Placement Configuration for VNICs & VHBAS			^
• Graphical representation of vNICs & vHBAs placement is	only applicable for Auto Configuration mode.		

Select **Deploy** to configure the Server Profile and validate all the steps are completed successfully.



Execution Flow

⊘	Deploy Boot Order Policy Completed
⊘	Deploy LAN Connectivity Policy Completed
⊘	Deploy Virtual Media Policy Completed
0	Deploy BIOS Policy Completed
0	Validate Virtual Media Policy Completed
0	Validate Boot Order Policy Completed
Ø	Validate LAN Connectivity Policy Completed
Ø	Validate BIOS Policy Completed
0	Prepare Server Profile Deploy

Verify

Use this section to confirm that your configuration works properly.

Validate the adapter settings on RHEL.

To check the currently available resources provided by the VIC adapter, validate the transmit and receive queues on the **dmesg** file:

\$ g	rep enic /var/log	/dmesg grep	resources										
[ra	ot@localhost ~]#	grep enic /vai	r∕log∕dmesg ¦gn	rep res	ource	ts:							
[2.647884] enic	0000:62:00.0:	WNIC resources	avail:	wq 8	} rq	8 cq	16	intr	18			
Ľ	2.6494301 enic	0000:62:00.0:	WNIC resources	used:	wq 8	} rq	8 cq	16	intr	18	intr	mode	MSI-X
Γ	2.657201] enic	0000:62:00.1:	WNIC resources	avail:	ωq8	rq 8	8 cq	16	intr	18			
I	2.6582721 enic	0000:62:00.1:	VNIC resources	used:	ազ ն	rq 8	8 cq	16	intr	18	intr	mode	MSI-X

Validate the configured Ring Size.

ethtool -g interface_name

[root@localhost	~]# ethtool -g enp98s0f0
Ring parameters	for enp98s0f0:
Pre-set maximums	
RX:	4096
RX Mini:	0
RX Jumbo:	0
TX:	4096
Current hardware	e settings:
RX:	4096
RX Mini:	0
RX Jumbo:	0
TX:	4096
[root@localhost	~]# ethtool -g enp98s0f1
[root@localhost Ring parameters	~]# ethtool -g enp98s0f1 for enp98s0f1:
[root@localhost Ring parameters Pre-set maximums	~]# <mark>ethtool -g enp98s0f1</mark> for enp98s0f1: s:
[root@localhost Ring parameters Pre-set maximums RX:	~]# <mark>ethtool -genp98s0f1</mark> for enp98s0f1: s: 4096
Eroot@localhost Ring parameters Pre-set maximums RX: RX Mini:	~]# ethtool -g enp98s0f1 for enp98s0f1: s: 4096 0
[root@localhost Ring parameters Pre-set maximums RX: RX Mini: RX Jumbo:	~]# ethtool -g enp98s0f1 for enp98s0f1: s: 4096 0 0
[root@localhost Ring parameters Pre-set maximums RX: RX Mini: RX Jumbo: TX:	~]# ethtool -g enp98s0f1 for enp98s0f1: s: 4096 0 0 4096
Eroot@localhost Ring parameters Pre-set maximums RX: RX Mini: RX Jumbo: TX: Current hardware	~]# ethtool -g emp98s0f1 for emp98s0f1: s: 4096 0 4096 settings:
Eroot@localhost Ring parameters Pre-set maximums RX: RX Mini: RX Jumbo: TX: Current hardware RX:	~]# ethtool -g emp98s0f1 for emp98s0f1: : 4096 0 4096 settings: 4096
Eroot@localhost Ring parameters Pre-set maximums RX: RX Mini: RX Jumbo: TX: Current hardware RX: RX Mini:	~]# ethtool -g emp98s0f1 for emp98s0f1: ;: 4096 0 4096 settings: 4096 0
<pre>[root@localhost Ring parameters Pre-set maximums RX: RX Mini: RX Jumbo: TX: Current hardware RX: RX Mini: RX Jumbo:</pre>	~]# ethtool -g emp98s0f1 for emp98s0f1: ;: 4096 0 4096 settings: 4096 0

Validate the adapter settings on VMware ESXi.

In order to check the current available resources provided by the VIC adapter, validate the transmit and receive queues with the command below, where X is the vmnic number.

vsish -e get /net/pNics/vmnicX/txqueues/info vsish -e get /net/pNics/vmnicX/rxqueues/info Run this command to validate the ring size:

esxcli network nic ring current get -n vmnicX

Validate the adapter settings directly on UCS.

In order to validate the settings, connect to any of the Fabric Interconnects via SSH.

Connect to the server adapter with the command **connect adapter x/y/z** where **x** is the chassis number, **y** is the slot number and **z** is the adapter number.

When connected to the adapter, on the extra login, enter dbgsh.

Run the command attach-mcp.

UCS-IMM-A# connect adapter 1/1/1

Next run the command vnicl, to list the available vnics.

Look for the corresponding vnic name eth0 and eth1 and validate the settings.

```
Entering character mode
Escape character is '^]'.
(none) login: dbgsh
adapter (top):1#
adapter (top):4# attach-mcp
adapter (mcp):1# vnicl
adapter (mcp):19# vnicl
------
vnicid : 18
name : eth0
type : enet
state : UP
adminst : UP
flags : OPEN, INIT, LINKUP, NOTIFY_INIT, ENABLE, USING_DEVCMD2
ucsm name : eth0
spec_flags : MULTIFUNC, TRUNK
mq_spec_flags :
slot : 0
h:bdf : 0:03:00.0
vs.mac : 00:25:b5:01:00:46
mac : 00:25:b5:01:00:46
vifid : 801
vifcookie : 801
uif : 0
portchannel_bypass : 0x0
cos : O
vlan : 0
rate_limit : unlimited
cur_rate : unlimited
stby_vifid : 0
stby_vifcookie : 0
stby_recovery_delay : 0
channel : 0
stdby_channel : 0
profile :
stdby_profile :
init_errno : 0
cdn : eth0
devspec_flags : TSO, LRO, RXCSUM, TXCSUM, RSS, RSSHASH_IPV4, RSSHASH_TCPIPV4, RSSHASH_IPV6,
RSSHASH_TCPIPV6
lif : 18
vmode : STATIC
encap mode : NONE
host wq : [11-18] (n=8)
```

host rg : [2010-2017] (n=8) (h=0x080107da) host cq : [2002-2017] (n=16) host intr : [3008-3025] (n=18) notify : pa=0x10384de000/40 intr=17 devcmd2 wg : [19] (n=1) vnicid : 19 name : eth1 type : enet state : UP adminst : UP flags : OPEN, INIT, LINKUP, NOTIFY_INIT, ENABLE, USING_DEVCMD2 ucsm name : eth1 spec_flags : MULTIFUNC, TRUNK mq_spec_flags : slot : 0 h:bdf : 0:03:00.1 vs.mac : 00:25:b5:01:00:45 mac : 00:25:b5:01:00:45 vifid : 800 vifcookie : 800 uif : 1 portchannel_bypass : 0x0 cos : O vlan : 0 rate_limit : unlimited cur_rate : unlimited stby_vifid : 0 stby_vifcookie : 0 stby_recovery_delay : 0 channel : 0 stdby_channel : 0 profile : stdby_profile : init_errno : 0 cdn : ethl devspec flags : TSO, LRO, RXCSUM, TXCSUM, RSS, RSSHASH_IPV4, RSSHASH_TCPIPV4, RSSHASH_IPV6, RSSHASH TCPIPV6 lif : 19 vmode : STATIC encap mode : NONE host wq : [20-27] (n=8) host rq : [2002-2009] (n=8) (h=0x080107d2) host cq : [1986-2001] (n=16) host intr : [2976-2993] (n=18) notify : pa=0x1038e27000/40 intr=17 devcmd2 wq : [28] (n=1)

Related Information

Technical Support & Documentation - Cisco Systems

Server Profiles in Intersight

Tuning Guidelines for Cisco UCS Virtual Interface Cards (White Paper)

Red Hat Enterprise Linux Network Performance Tuning Guide