Lenovo



Configuring SR-IOV and SIOV in VMware vSphere on Lenovo ThinkSystem Servers Planning / Implementation

With the rapid development of cloud computing and virtualization technology, the computing environment for businesses has started to use virtual machines to improve resource utilization and flexibility. It creates the need for efficient I/O virtualization technologies. Traditional approaches to I/O virtualization usually rely on the software layer to manage the sharing of I/O devices, which can lead to low performance and high latency. Single Root I/O Virtualization and Sharing (SR-IOV) and Intel Scalable I/O Virtualization (SIOV) are two approaches to address these challenges by hardware-assisted I/O virtualization.

Single Root I/O Virtualization and Sharing (SR-IOV) is an optional feature of the PCIe standard that enables hardware-assisted I/O virtualization, allowing physical I/O devices to be shared across multiple VMs or containers. An SR-IOV capable device has a Physical Function (PF) and multiple Virtual Functions (VFs). Device sharing is achieved by assigning VFs to different VMs or containers. The PF is responsible for managing and configuring VFs by the driver running in the hypervisor.

Intel Scalable I/O Virtualization (SIOV) is also an approach to hardware-assisted I/O virtualization developed by Intel. SIOV enables high scalability and high-performance sharing of I/O devices across VMs or containers by further granulating I/O devices.

The difference between SR-IOV and SIOV

A Single Root I/O Virtualization and Sharing (SR-IOV) device comprises a Physical Function (PF) and multiple Virtual Functions (VFs). As illustrated in the following figure, the PF manages and configures the device, while VFs provide I/O functionality without configuration or management capabilities. The number of VFs of SR-IOV devices is limited and the allocated resources are fixed. It is preset at device design time; users can only enable a specific number of VFs within this predefined range.





Intel Scalable I/O Virtualization (SIOV) is a new hardware-assisted IO virtualization solution, the structure is shown in the figure below. The resources of SIOV devices are divided into finer granularities, with the type and number of backend resources grouped to compose an Assignable Device Interface (ADI). An ADI refers to the set of device backend resources that are allocated, configured, and organized as an isolated unit, forming the unit of device sharing. ADI composing a virtual device (VDEV) is assigned to the VM. Each VDEV may be backed by one or more ADIs. A VDEV may be composed of a static number of ADIs that are pre-allocated at the time of VDEV instantiation or composed dynamically in response to guest driver requests to allocate/free resources.

SR-IOV is a mature standard that is widely supported, and easy to configure and use. While SIOV offers higher flexibility and scalability, SIOV is relatively new and less standardized.



Figure 2. Intel Scalable I/O Virtualization

All in all, SR-IOV and SIOV have their own benefits and limitations, and their differences are summarized in the table below.

Table 1.	Comparing	SR-IOV	and SIOV
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Feature	SR-IOV	SIOV
Granularity	Limited to predefined Virtual Functions (VFs).	Offers finer granularity through Assignable Device Interfaces (ADIs).
Scalability	Fixed number of VFs determined during device design.	High scalability with dynamic ADI allocation.
Flexibility	Lacks flexibility; VFs are static.	Highly flexible; ADIs can be allocated/reallocated dynamically.
Configuration Ease	Widely supported and easier to configure.	Requires more complex setup and newer hardware/software.
Adoption Status	Mature and standardized.	Emerging and less standardized.
Use Cases	Common in traditional virtualization scenarios.	Ideal for AI, machine learning, and dynamic workloads.

Implementing SR-IOV

This section describes the steps to configure and enable SR-IOV in VMware ESXi 8.0 U3 on the Lenovo ThinkSystem Server. In our lab tests, we are using the Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter as an example. This adapter has its own SR-IOV switch in the BIOS, so it it is well-suited as an example.

- Prerequisites for SR-IOV
- Enabling SR-IOV in UEFI
- Configuring SR-IOV in ESXi

The test configuration of ThinkSystem SR650 V3 is listed in the following table.

Component	Configuration
Server	ThinkSystem SR650 V3 Server
CPU	2x Intel Xeon Platinum 8468 processors
Memory	2x DDR5 4800MHz 16GB DIMMs
HDD	4.0TB SATA HDD
Host	ESXi 8.0 U3 Custom Image for Lenovo ThinkSystem
Guest OS	RHEL 9.3
SR-IOV Device	Broadcom 57454 10GBASE-T 4-port PCIe Ethernet Adapter

Table 2. SR-IOV test configuration

Prerequisites for SR-IOV

To use SR-IOV, the system must meet the following requirements:

- Supported System: Intel VT for Directed I/O (VT-d) or AMD Virtualization (AMD-V).
- The device must be supported SR-IOV by ESXi: To check supported devices, see the VMware Compatibility Guide and select SR-IOV under Features as a search option.
- The vSphere ESXi host supports a limited number of VFs and VMDirectPath PCI/PCIe devices. Refer to the configuration maximum guide for more information: https://kb.vmware.com/s/article/1003497.

Enabling SR-IOV in UEFI

The process to enable SR-IOV in UEFI is as follows.

- 1. Power on the Lenovo ThinkSystem server, then press F1 to enter System Setup.
- For the Intel platform: Enable Intel VT-d and SR-IOV, and reboot. Select System Settings > Devices and I/O Ports, ensure that Intel VT for Directed I/O (VT-d) and SRIOV options are enabled as shown in the following figure.

	Devices and I/O Ports	
Onboard SATA 1 Mode Onboard SATA 2 Mode Onboard SATA 3 Mode Active Video PCI 64-Bit Resource Allocation MM Config Base Intel® VT for Directed I/O (VT-d) DMA Control Opt-In Flag SRIOV	[AHCI] [AHCI] [AHCI] [Onboard Device] [Auto] [Auto] [Enabled] [Disabled] [Enabled]	[Enabled] or [Disabled] the support of resource allocation for Single Root I/O Virtualization(SR–IOV) virtual functions during boot.
 Enable / Disable Onboard Device(s) Enable / Disable Adapter Option ROM Set Option ROM Execution Order PCIE Gen Speed Selection Override Slot Bifurcation 	Support	
 ▶ Console Redirection Settings ▶ USB Configuration ▶ Intel® VMD technology 		
†∔=Move Highlight	<enter>=Select Entry</enter>	<esc>=Backwards</esc>

Figure 3. Enabling VT-d and SRIOV in UEFI

 For the AMD platform: Enable SVM Mode, SR-IOV, IOMMU, and reboot. Select System Settings > Devices and I/O Ports and ensure that IOMMU and SRIOV options are enabled as shown in the following figure.

	Devices and I/O Ports	
Active Video PCI 64-Bit Resource Allocation IOMMU SRIOV PCIE ARI Forwarding PCIE Ten Bit Tag Support • Enable / Disable Onboard Device(s) • Enable / Disable Adapter Option ROM • Set Option ROM Execution Order • PCIE Gen Speed Selection • Override Slot Bifurcation • Console Redirection Settings • USB Configuration	[Onboard Device] [Auto] [Enabled] [Disabled] [Enabled] [Enabled] Support	Enable/Disable IOMMU.
†↓=Move Highlight	<enter>=Select Entry</enter>	<esc>=Backwards</esc>

Figure 4. Enabling IOMMU and SRIOV in UEFI

4. Select **System Settings** > **Processors** and ensure that the **SVM Mode** option is enabled as shown in the following figure.

Determinism Slider Core Performance Boost	[Performance]	
CTDP Package Power Limit Global C-state Control DF P-states MONITOR/MWAIT P-State ACPI SRAT L3 Cache as NUMA Domain L1 Stream HW Prefetcher L2 Stream HW Prefetcher L1 Stride Prefetcher L1 Region Prefetcher L1 Region Prefetcher SMT Mode CPPC BoostFmax SVM Mode APIC Mode	[Enabled] [Auto] [Auto] [Enabled] [Auto]	▲ Enable/disable CPU Virtualization
†↓=Move Highlight	<enter>=Select Entry</enter>	<esc>=Backwards</esc>

Figure 5. Enabling SVM Mode in UEFI

5. Some devices have a separate SR-IOV option in UEFI, make sure it is enabled. For example, the device

Broadcom 57454 10GBASE-T 4-Port PCIe Ethernet Adapter. You can enter in **System Settings** > **Network** > **Broadcom 57454 10GBASE-T 4-Port PCIe Ethernet Adapter** > **Device Configuration Menu** to find its SR-IOV Settings, and ensure it is enabled.



Figure 6. Enabling SR-IOV in the adapter settings in UEFI

6. Save settings and reboot.

Configuring SR-IOV in ESXi

After enabling SR-IOV in UEFI Settings, boot into ESXi and enable SR-IOV according to the following steps.

- 1. Log in to the vSphere client.
- Select Manage > Hardware > PCI Devices from the left navigation menu. Select the SR-IOV device, the SR-IOV item should be "Disabled" and select "Configure SR-IOV". If the item is "Not Capable", please check the configuration of the system and UEFI settings.

vm ESXi Host Client						Help ▼ Q Search			
☆ Navigator 《	localhost.labs.lenovo.com - Ma	nage							
V 🖥 Host	System Hardware Packages	Serv	vices Security 8	users					
Manage									
Monitor	PCI Devices	-	Toggle passthro	ough 🕜 Configure SR-IOV 🔗 Hardware label 🖓 🖫 R	eboot host C	Refresh			
🛱 Virtual Machines 🛛 0	Power Management	Power Management Q Search							
Storage 2			Address 🗸	Description	v SR-IOV v	Passthrough 🗸 Hardware L 🗸			
♀ Networking 1						Not capable			
						Not capable			
	The second se				Not capable	Not capable			
		~	0000:02:	Broadcom 57454 10GBASE-T 4-Port PCIe Ethernet Adapter	Disabled	Disabled			
					Not capable				
	1000 Contraction (1997)								
	· ·								
						Not capable			
		Qui	ick filters	~		174 items			

Figure 7. Configure SR-IOV in ESXi client

3. As shown in the figure below, set the **Enabled** option to **Yes** and enter the desired number of virtual functions between 1 and the maximum value shown in the window.

0000.00.01.2	Advanced Micro De	
Configure SR-	IOV for 57454 10	DGBASE-T 4-Port PCIe Et
Enabled		• Yes O No
Virtual functions		8 🗘 Maximum 8
1	57454 10GBAS	E-T 4-Port PCIe Ethernet Adapter

Figure 8. Enabling SR-IOV and set the number of VFs

- 4. Save the Settings and reboot for the configuration to take effect.
- 5. Navigate to the PCI Device menu again to ensure the VF devices are on the list, as shown below. The number of VF devices is equal to the number set in Step 3. The function of each VF device is identical, with no priority order; The only difference is their PCI device ID, which you can use to distinguish them.

vm ESXi Host Client				root@10.245.39.182 - Help	- Q Search
G Navigator ≪	Jocalhost.labs.lenovo.com - Man System Hardware Packages	age Services Security & users			
Manage Monitor	PCI Devices	Toggle passthrough	🖋 Configure SR-IOV 🕜 Hardware label 🦉 🔂 Reboot host 🕴 📿 Ref	fresh	Q PCI X
Virtual Machines Storage 2	Power Management	Address v	Description v Advanced Micro Devices, Inc. [AMD] Turin OPP Bridge	SR-IOV V Passthrough Not capable Not capable	V Hardware Label
tio.NVMeSSDPE		0000:00:01.2	Advanced Micro Devices, Inc. [AMD] Turin GPP Bridge	Not capable Not capable	
More storage		0000:03:05.6	Broadcom BCM5/454 NetXtreme-E Virtual Function Broadcom BCM57454 NetXtreme-E Virtual Function	Not capable Active	
ti, vmk0		 0000:03:05.5 0000:03:05.4 	Broadcom BCM57454 NetXtreme-E Virtual Function Broadcom BCM57454 NetXtreme-E Virtual Function	Not capable Active Not capable Active	
> Ø VM Network		0000:03:05.3	Broadcom BCM57454 NetXtreme-E Virtual Function	Not capable Active	
More networks		0000:03:05.2	Broadcom BCM57454 NetXtreme-E Virtual Function Broadcom BCM57454 NetXtreme-E Virtual Function	Not capable Active Active	
		0000:03:05.0	Broadcom BCM57454 NetXtreme-E Virtual Function Broadcom 57454 10GBASE-T 4-Port PCIe Ethernet Adapter	Not capable Active Active Disabled	
		Quick filters	×) 185 items .i

Figure 9. Verify SR-IOV is active

6. Passthrough the VF to Virtual Machine (VM) as shown below. Choose a VM, click the Edit > Add other device > PCI device.

vm ESXi Host Client			root@10.245.39.18	2 🕶 🛛 Help 👻 📄 📿 Search
ি Navigator 《	🛱 localhost.labs.lenovo.com - Virtual Machines			
✓ 🔚 Host Manage	+ Create / Register VM 🔰 🗐 Console	Power on () Power off	end C Refresh 🌣 Actions	
Monitor	Uirtual machine	Status V Used space V Guest C	OS v Host name	✓ Host CPU ✓ Host memory ✓
🗟 Virtual Machines 1	✓ <u>SR-IOV test</u>	Nor 185 KB Red Ha	at Enterprise Linu Unknown	O MHz O MB
Version Storage 2 Version datastore1 (1)	au 🛱 Edit settings - SR-IOV_test (E	SXi 8.0 U2 virtual machine)		1 items
Monitor	Virtual Hardware VM Options			CP11 +++
More storage	🕞 Add hard disk 🗧 Add netwo	rk adapter 📕 Add other device		о мнг Ц
Networking) 💭 CPU 🛕	4 V CD/DVD drive		
		2 Floppy drive		STORAGE
	> 🎟 Memory 🛕	Serial port		1.85 KB
	> 🕞 New Hard disk 🔺	12 Parallel port	×	
	> 🗲 SCSI Controller 0	VMware Pa	×	
	SATA Controller 0	Sound controller	×	
	⊷ USB controller 1	D PCI device		
		USB 2.0 Dynamic PCI device	×	
	> 🛱 Network Adapter 1	VM Networ VM Networ SATA controller	Connect X	
	> 🚱 CD/DVD Drive 1	Host device 😰 NVMe controller	Connect X	
		Default sett	~	
	> L Video Card	Precision Clock		
	Re		CANCEL SAVE	
	Task			✓ Completed ▼

Figure 10. Add a PCI device

7. You can see the VF devices that just appeared in the PCI device list under the New PCI device option as shown below. Determine the VF device to use based on the name and PCI device ID. In our lab environment, the SR-IOV device is the BCM57454 and we want to select VF0, so we select **BCM57454 NexXtreme-E Virtual Function-000:03.02.0** as highlighted in the figure. Select it and save the settings.

Qui	🗗 Edit settings - SR-I	OV_test (ES>	(i 8.0 U2 vi	rtual machin	e)				٦	0 MHz
	Virtual Hardware									
п.	🖨 Add hard disk	adapter	🖪 Add other	device				L.		
) 💭 CPU 🛕		4 ~ (U	
Γ	> 🎹 Memory 🛕		2	GB	~				U	
) 🔁 New Hard disk 🛕		12	GB	~			×	U	
	> 🗲 SCSI Controller 0		VMware Para	avirtual		~		×	U	
	🔄 SATA Controller 0							×	U	
	🚓 USB controller 1		USB 2.0			~		×	l	
	> 🔄 Network Adapter 1		VM Network			~	Connect	×	U	
	> 🜀 CD/DVD Drive 1		Host device			~ (Connect	×	U	
	> 🗖 Video Card		Default settings		~					
) 🗵 New PCI device		BCM57454 N BCM57454 N	letXtreme-E Virt letXtreme-E Virt	ual Function ual Function	- 0000:03: - 0000:03	:02.0	×	T	
Rec			BCM57454 N	letXtreme-E Virt	ual Function	- 0000:03	:02.1		- 1	
ask			BCM57454 N	letXtreme-E Virt	ual Function	- 0000:03	:02.2	EL SAVE		
pov Virtu	al Disk	[datastore1 (1)] PHE	BCM57454 N	letXtreme-E Virt	ual Function	- 0000:03	:02.3	19 Com	pleted	successfully
eate VM			BCM57454 N	letXtreme-E Virt	ual Function	- 0000:03	:02.4	05 Com		successfully
odate Pa		localhost.labs.lenovo	BCM57454 N	letXtreme-E Virt	ual Function	- 0000:03	:02.5	30 📿 Com		successfully
uto Start	Power On	localhost.labs.lenovo	BCM57454 N BCM57454 N	letXtreme-E Virt letXtreme-E Virt	ual Function ual Function	- 0000:03 - 0000:03	:02.6 :02.7	27 📀 Com		successfully

Figure 11. Select the VF device

8. Power on the VM and boot into the guest OS. You can see the VF in the PCI device list using the lspci command.

SR-I	OV_test					🏟 Acti	ons
Se Ac	tivities	Derminal	Oct 12 05:47			÷	Φ
€			root@localhost:~		٩	Ξ	×
[root@l redhat- [root@l Red Hat [root@l 00:01.0 00:07.0 00:07.1 00:07.7 00:0f.0 02:00.0 02:02.0 02:02.0 02:03.0 02:04.0 03:00.0 02:04.0 03:00.0	ocalhost release ocalhost Enterpris ocalhost Host brid PCI brid IDE inter Bridge: J System pr VGA compr VGA compr USB contr USB contr Ethernet ocalhost	<pre>P]# cat /etc/re resolv.conf resolv.conf r]# cat /etc/redhase se Linux release 9 r]# lspci Igge: Intel Corporat rface: Intel Corporat rface: Intel Corporat rface: Intel Corporat rface: Intel Corporation eripheral: VMware tible controller: VMware scontroller: VMware USB rooller: VMware USB troller: VMware USB troller: VMware USB rooller: VMware USB rooller: VMware USB rooller: VMware USB rooller: VMware USB rooller: VMware USB roontroller: Broad rJ#</pre>	t-release .3 (Plow) tion 440BX/ZX/DX - 82443BX/ZX/DX Host bridge (rev 01) ion 440BX/ZX/DX - 82443BX/ZX/DX AGP bridge (rev 01) ion 82371AB/EB/MB PIIX4 ISA (rev 08) ration 82371AB/EB/MB PIIX4 IDE (rev 01) 82371AB/EB/MB PIIX4 ACPI (rev 08) Virtual Machine Communication Interface (rev 10) VMware SVGA II Adapter oller: VMware PVSCSI SCSI Controller (rev 02) 1.1 UHCI Controller e VMXNET3 Ethernet Controller (rev 01) 2 EHCI Controller TA AHCI controller com Inc. and subsidiaries BCM5745X NetXtreme-E Ethernet Virtual	l Function			

Figure 12. Verifying the VF device

Implementing SIOV

This section describes the steps to configure and enable SIOV and passthrough VDEV to the virtual machine in VMware ESXi 8.0 U2 on the server.

In our lab tests, we are using the Intel QuickAssist Technology (Intel QAT) accelerator as an example. Intel QAT is PCIe device that provides cryptographic and compression acceleration. It enables sharing of a Physical Function across multiple guest Virtual Machines (VM) using SIOV.

- Prerequisites for SIOV
- Enabling SIOV in UEFI
- Configuring SIOV in ESXi

The test configuration of ThinkSystem SR650 V3 is listed in the following table.

Component	Configuration
Server	ThinkSystem SR650 V3 Server
CPU	2x Intel Xeon Platinum 8592+ processors
Memory	16x DDR5 4800MHz 16GB DIMMs
HDD	4.0TB SATA HDD
Host	ESXi 8.0 U2 Custom Image for Lenovo ThinkSystem
Guest OS	Ubuntu 22.4
SIOV Device	Intel QuickAssist Technology (Intel QAT) accelerator

Table 3. SIOV test configuration

Prerequisites for SIOV

ESXi has these limitations when using SIOV:

- The device must be supported SIOV by ESXi: Check with the adapter vendor's web site to confirm that the device supports SIOV in ESXi.
- The vSphere ESXi host supports a limited number of PCI passthrough devices. Refer to the configuration maximum guide for more information: https://kb.vmware.com/s/article/1003497.
- The virtual IOMMU option for VM is not compatible with VDEVs on ESXi.
- vSphere Host Client doesn't support SIOV setting. You need VMware vCenter to complete the configuration of SIOV devices.

Enabling SIOV in UEFI

To enable SIOV in UEFI, follow the same steps to enable SR-IOV as described in Enabling SR-IOV in UEFI. The steps remain consistent across all devices, except Step 5. Step 5 depends on the specific device.

- 1. Please skip Step 5 if the device does not have its own SR-IOV switch in BIOS.
- 2. The configuration entry is device-specific if the device has its own SR-IOV switch in BIOS.

Consult your device manufacturer for information on whether the device has its own SR-IOV switch and how to configure it.

Configuring SIOV in ESXi

The following steps build on the assumption that Intel QAT devices are already available on ESXi. For more information on Intel QAT device driver selection and installation, see the Lenovo Press paper, Implementing the Intel DLB and Intel QAT Accelerators on ThinkSystem Servers Running VMware ESXi.

The steps are as follows:

1. Log in to the VMware vCenter via vSphere Client.

Note: vSphere Host Client doesn't support VDEVs assignment to VM via VM settings.

- 2. Locate the target VM in the inventory. Make sure the VM is powered down.
- 3. In the center pane, click **Edit Settings** to edit VM configuration. A pop-up window with the VM settings will appear.
- 4. All memory for the VM must be reserved. Expand **Memory** and check that Reservation section is reporting the following (see the figure below):

All VM memory is reserved for this VM.

If you do not see this message, check the Reserve all guest memory (All locked) checkbox.

			ADD NEW DEVICE
>	CPU	<u>4</u> v (j)	
~	Memory	GB ~	
	Reservation	All VM memory is reserved for this VM. (1)	
	Limit	Unlimited MB 🗸	
	Shares	Normal ~ 40960 ~	
	Memory Hot Plug	Enable	
>	Hard disk 1	12 GB ~	
>	SCSI controller 0	VMware Paravirtual	
>	Network adapter 1	VM Network > Connected	
>	CD/DVD drive 1	Host Device v Connect At Power On	
>	USB controller	USB 2.0	
>	PCI device 0	Asymmetric Crypto vQAT Device	
>	Video card	Auto-detect settings v	
>	SATA controller 0	AHCI	
>	Security Devices	Not Configured	
>	Other	Additional Hardware	

Figure 13. Edit VM settings

5. Click the Add New Device dropdown menu and choose PCI Device as shown below.

ware est U: Virtua	I Hardware VM Option	s Advanced Parameters		^
	PU femory	<u>4 v</u> (1) 4 v	GB ∨	Disks, Drives and Storage Hard Disk
> F	lard disk 1	12 VMware Paravirtual	GB ~	RDM Disk Host USB Device
> > >	letwork adapter 1	VM Network V Conn Host Device V	ected] Connect At Power On	NVDIMM CD/DVD Drive Controllers NVMe Controller
> u > v	ISB controller /ideo card	USB 2.0 Auto-detect settings v		SATA Controller SCSI Controller
> s	ATA controller 0	AHCI Not Configured		USB Controller Other Devices PCI Device
> 0)ther	Additional Hardware		Watchdog Timer Precision Clock Serial Port

Figure 14. Add New Device menu

6. The available VDEV devices are listed as shown below. Select the VDEV device that belongs to your SIOV device by name and apply to continue. Each SIOV device has its own VDEV name, which depends on the manufacturer of the device. If you do not know, consult the manufacturer of the SIOV device. In our lab configuration, the SIOV Device is Intel QAT and its VDEV device name is **Asymmetric Crypto vQAT Device**.

Edit Settings qa	t_test	
Virtual Hardware VM Opt	ions Advanced Parameters	
PCI device 0 will be remove	ed.	<u>Undo</u> X
		ADD NEW DEVICE ~
> CPU	4 ~ (1)	
Device Selection	Y Access Type	▼ Manufacturer ▼
O Data Compression vG	AT Device Enhanced DirectPath I/O	Intel Corporation
 Asymmetric Crypto v 	QAT Device Enhanced DirectPath I/O	Intel Corporation
Manage Columns		2 items
Manage Columns		2 items CANCEL SELECT
Manage Columns	AHCI	2 items CANCEL SELECT
Manage Columns Manage Columns SATA controller 0 Security Devices	AHCI Not Configured	2 items CANCEL SELECT
Manage Columns Manage Columns SATA controller 0 Security Devices Other	AHCI Not Configured Additional Hardware	2 items CANCEL SELECT
Manage Columns Manage Columns SATA controller 0 Security Devices Other	AHCI Not Configured Additional Hardware	2 items CANCEL SELECT

Figure 15. Select the VDEV device

- 7. Click **OK** to save the VM configuration and power on the VM.
- 8. Log in to the guest OS.
- 9. Use the lspci command to view PCI devices including VDEV devices. The VDEV PCI device name and PCI device ID are specified by the device manufacturer. If you do not know, please consult your SIOV device manufacturer. In this case, the PCI Device identification for VDEV is 03:00.00: Intel Corporation Device 0da5.

root@ubuntu22:/QAT# lspci
00:00.0 Host bridge: Intel Corporation 440BX/ZX/DX - 82443BX/ZX/DX Host bridge (rev 01)
00:01.0 PCI bridge: Intel Corporation 440BX/ZX/DX - 82443BX/ZX/DX AGP bridge (rev 01)
00:07.0 ISA bridge: Intel Corporation 82371AB/EB/MB PIIX4 ISA (rev 08)
00:07.1 IDE interface: Intel Corporation 82371AB/EB/MB PIIX4 IDE (rev 01)
00:07.3 Bridge: Intel Corporation 82371AB/EB/MB PIIX4 ACPI (rev 08)
00:07.7 System peripheral: VMware Virtual Machine Communication Interface (rev 10)
00:0f.0 VGA compatible controller: VMware SVGA II Adapter
02:00.0 Serial Attached SCSI controller: VMware PVSCSI SCSI Controller (rev 02)
02:01.0 USB controller: VMware USB1.1 UHCI Controller
02:02.0 Ethernet controller: VMware VMXNET3 Ethernet Controller (rev 01)
02:03.0 USB controller: VMware USB2 EHCI Controller
02:04.0 SATA controller: VMware SATA AHCI controller
03:00.0 Co-processor: Intel Corporation Device 0da5 (rev 02)

Figure 16. Verifying the virtual device is active

References

For more information, see these resources:

- Configure a Virtual Machine to Use SR-IOV https://docs.vmware.com/en/VMware-vSphere/8.0/vsphere-networking/GUID-CC021803-30EA-444D-BCBE-618E0D836B9F.html
- Intel QAT downloads https://www.intel.com/content/www/us/en/developer/topic-technology/open/quick-assisttechnology/overview.html

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