

# VMware<sup>®</sup> ESXi<sup>®</sup> on Intel<sup>®</sup> VMD VROC

**Revision 1.0** 

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### Document Revision History

Date	Revision	Description
9/1/2021	1.0	Initial document.

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## **1** Overview

This document is a guide for field application engineers, system engineers, and technicians to install redundant VMware<sup>®</sup> ESXi<sup>®</sup> hypervisor images on a RAID1 volume on an Intel Gen 1, 2, 3 Intel<sup>®</sup> Xeon Scalable platform.

## **1.1 Software Requirements**

Make sure the platform BIOS supports VROC EFI 7.6.

At the time of this writing, VMware<sup>®</sup> ESXi<sup>®</sup> does not have native support for RAID1 mirroring. Refer to the link below to create a VMware<sup>®</sup> ISO that has the out-of-box VMD driver.

https://www.intel.com/content/dam/support/us/en/documents/memory-and-storage/ssdsoftware/Intel\_VMD\_NVMe\_VMWare\_User\_Guide.pdf

Drivers	Software Layer
VROC EFI 7.6	Platform BIOS
Intel VMD/NVMe Driver	VMware ESXi

Table 1-1. Required Drivers at Each Software Layer

### **1.2 Hardware Requirements**

The system requires an Intel VROC key and two M.2 NVMe drives. Gen 1 and 2 processors do not support VMD lanes on the PCH.

Processor	РСН	CPU	Number of RAID1 Volumes per VMD Lane
Gen 1, 2	No	Yes	One
Gen 3	Yes	Yes	One

Table 1-2. Processor Generation and Supported VMD Lanes

# 2 Example 1

This example uses SYS-1029P-WTRT with AOC-SLG3-2M2 in slot 2. Follow the system manual to install the M.2 AOC.

Upgrade to the latest BIOS to enable VROC EFI 7.6 driver support.

	[Sat 08/21/2021]	Set the Date. Use Tab to switch between Date
System Time	[12:32:57]	elements.
Cuperpiere VIIDU N/L/C)		Default Ranges:
SUPERMICRO XIIDDW-N/L(F) BIDS Version	T20210831103549	Year: 1998-9999
Build Date	08/31/2021	Days: Dependent on month
CPLD Version	02.84.08	Range of Years may vary.
Memory Information		
Total Memory	131072 MB	
		the Collect Concer
		tl. Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit

Follow the system manual to find which CPU supports the M.2 AOC. In this example, the AOC is supported by CPU2.

Select "Intel VMD for Volume Management Device on CPU2."

Commented [WT(W1]: "Chipset Configuration" -> "North Bridge" -> "IIO Configuration" -> "Intel VMD Technology"



Enable the "VMD" for RSC-R1UW-2E16 that contains the M.2 NVMe devices. The other two VMDs will remain disabled.



Configure the VMD VROC RAID.



Configure RAID1 for the M.2 NVMe devices.

Create RAID Volume		Create a volume with the settings specified above
Name: RAID Level: Enable RAID Spanned over VMD Controllers:	VolumeO [RAID1(Mirror)] []]	
Select Disks:		
Samsung SSD 970 EVO Plus 500GB SN:S58SNJON109665N, 465.76GB Port 2:2 CPU1 VMD1	[X]	
WDS500G3X0C-00SJG0 SN:21043U808411, 465.76GB Port 2:3 CPU1 VMD1	[X]	
Capacity (GB):	442.47	
		→+: Select Screen
		T4: Select Item
		+/-: Change Ont
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & EXIT

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After finishing the VMD VROC configuration, you can use "Boot Override" to select the ISO boot. You must boot the ISO in EFI mode in order for VMware to load the VMD EFI and detect the VMRAID.



Select the VMRAID as the target VD for VMWare ESXi installation.

Select a Disk to Install or Upgrade (any existing VMFS-3 will be automatically upgraded to VMFS-5) * Contains a VMFS partition # Claimed by VMware vSAN			FS-5)	
Storage Device Local:				Capacity
Remote: (none)	U.VNDRATD_NNVOT	awsaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaaa		2.40 018
(Esc) Cancel	(F1) Details	(F5) Refresh	(Enter) Con	

Configure the first boot device as "UEFI Hard Disk: UEFI OS".

Boot Configuration		Sets the system boot ord
Boot mode select	[UEFI]	
LEGACY to EFI support	[Disabled]	
FIXED BOOT ORDER Priorities		
Boot Option #1		
Boot Option #2	[UEFI CD/DVD]	
Boot Option #3	[UEFI USB Hard Disk]	
Boot Option #4	[UEFI USB CD/DVD]	
Boot Option #5	[UEFI USB Key]	
Boot Option #6	[UEFI USB Floppy]	
Boot Option #7	[UEFI USB Lan]	
Boot Option #8	[UEFI Network]	
Boot Option #9	[UEFI AP:UEFI:	
	Built-in EFI Shell]	
and the second		++: Select Screen
Add New Boot Option		1↓: Select Item
▶ Delete Boot Option		Enter: Select
▶ UEFI Hard Disk Drive BBS Priorities		F1: General Help
▶ UEFI Application Boot Priorities		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

VMWare ESXi will run after OS installation.

VMware ESXi 6.7.0 (VMKernel Release Build 14320308)	
Supermicro Super Server	
2 x Intel(R) Xeon(R) Silver 4116 CPU @ 2.10GHz	
To manage this host go to: http://NHI-GLOSCINED/ http://ICI.35.187/ (DHCP) http://ICI@B0:aeifi-Gbff:fec7/afGe1/ (STATIC)	

Screenshot of the successfully launched ESXi VSphere GUI.

vmware' esxi"			root@172.31.35.18	7 •   Help •   Q Search
🖥 Navigator 🛛	WN-GLCL9CTWED.supermicro.com - Storage			
* 🗍 Host	Datastares Adapters Devices Persistent Illemony			
Monitor	🧕 Configure ISCSI 📱 Software ISCSI 📕 Rescan   🕻 Refresh   🔕 Actions			Q. Search
) 🔂 Virtual Machines 🗾 🚺	Name	Model ~	Status v	Driver v
🛯 Storage 📃 🚺	🙀 vmhba0	Lewisburg SATA AHCI Controller	Unknown	vmir_ahci
🧕 Networking 👘 🚺	witte1	Lewisburg SATA AHCI Controller	Unknown	vmu_ahd
	📕 emite2	Intel Volume Management Device	Unknown	intel-nyme-ymd
				3 items

# 3 Example 2

This example uses SYS-2029U-TN24R4T.

Upgrade to the latest BIOS to enable VROC EFI 7.6 driver support.

Disable the VMD lane connected to AOC-2UR6N4 slot 1.

Chipset Configuration > North Bridge > IIO Configuration > Intel VMD Technology > Intel VMD for Volume Management Device on CPU1.



VMD Config for PStackO	Enable/Disable Intel®	
Intel® VMD for Volume Management Device for PStack0 VMD Config for PStack1	[Disable]	Technology on specific root
Intel® VMD for Volume Management Device for PStack1	[Enable]	
Hot Plug Capable	[Disable]	
VMD Config for PStack2		
Intel® VMD for Volume Management	[Enable]	
ADC-2UR6N4 NVME1 VMD	[Enable]	
Hot Plug Capable	[Enable]	
		→+: Select Screen
		↑↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Optimized Defaults
		F4: Save & Exit
		ESC: Exit

Enable hot-plug on CPU2.

Chipset Configuration > North Bridge > IIO Configuration > Intel VMD Technology > Intel VMD for Volume Management Device on CPU2.

VMD Config for PStackO	Enable/Disable Hot Plug fo	
Intel® VMD for Volume Management Device for PStack0 VMD Config for PStack1	[Disable]	FOLD ROUT FORTS 2H-2D
Intel® VMD for Volume Management Device for Pstack1	[Enable]	
RSC-U2N4-6 NVME1 VMD	[Enable]	
VMD Config for PStack2		
Intel© VMD for Volume Management Device for PStack2	[Disable]	
		++: Select Screen
		t↓: Select Item
		Enter: Select
		+/-: Change Opt.
		F1: General Help
		F2: Previous Values
		F3: Uptimized Defaults
		TH. Save a Exit

Save changes and reset.



Press the "DEL" key to re-enter the BIOS to configure VROC.





Go to the Save & Exit tab. Select to boot from the UEFI USB, CD, or PXE source that contains the VMware ESXi ISO.



Install the VMware ESXi on to VMRAID as shown in the following example:

(any existin * Contains a VMFS # Claimed by VMwa	Select a Disk t g VMFS-3 will be partition re vSAN	o Install or Upg automatically u	prade opgraded to	o VMFS-5)
Storage Device				Capacity
Local: VIDRATO NN († Remote: (none)	LO . VMDRA ID_MNVo I			
(Esc) Cancel	(F1) Details	(F5) Refresh		Continue