



# **Intel® Virtual RAID on CPU (Intel® VROC) and Intel® Volume Management Device (Intel® VMD)**

**Supported Configurations**

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***Revision 5.2***

**October 2024**



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## Revision History

Revision Number	Description	Revision Date
1.0	<ul style="list-style-type: none"><li>• Initial release</li></ul>	May 2022
2.0	<ul style="list-style-type: none"><li>• Revision update</li></ul>	July 2022
2.3	<ul style="list-style-type: none"><li>• Updated for Intel® VROC 7.8.</li></ul>	October 2022
2.4	<ul style="list-style-type: none"><li>• Updated for Intel® VROC 8.0.</li></ul>	February 2023
2.5	<ul style="list-style-type: none"><li>• Minor updates for Intel® VROC 8.0</li></ul>	May 2023
3.0	<ul style="list-style-type: none"><li>• Revision update for Intel® VROC 8.2</li></ul>	August 2023
4.0	<ul style="list-style-type: none"><li>• Revision update for Intel® VROC 8.5</li></ul>	November 2023
4.1	<ul style="list-style-type: none"><li>• Corrected typographical error in NVMe* table.</li></ul>	December 2023
4.2	<ul style="list-style-type: none"><li>• Corrected typographical error in NVMe* table.</li></ul>	December 2023
4.3	<ul style="list-style-type: none"><li>• Revision update for Intel® VROC 8.6</li></ul>	March 2024
4.4	<ul style="list-style-type: none"><li>• Update table of NVMe* SSD Support List</li></ul>	May 2024
5.0	<ul style="list-style-type: none"><li>• Updated for Intel® VROC 9.0 (Sierra Forest; SRF -SP)</li><li>• Updated table of NVMe* SSD Support List</li></ul>	July 2024
5.1	<ul style="list-style-type: none"><li>• Updated NVMe* Support list to point to a new webpage</li></ul>	September 2024
5.2	<ul style="list-style-type: none"><li>• Updated for Intel® VROC 9.1 (Sierra Forest; SRF -SP/-AP)</li><li>• Updated for Intel® VROC 9.1 (Granite Rapids; GNR -SP/-AP)</li><li>• Added platform backward compatible table</li><li>• BHS is removing RHEL8.x out of box supporting</li></ul>	October 2024



# 1 Introduction

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Intel® VROC 9.0/9.1; Intel® VMD 4.0

This document covers the NVMe\* solid-state drives (NVMe\* SSDs), operating systems (OSes), and configurations supported by Intel® Virtual RAID on CPU (Intel® VROC). If any of the support information presented in this document conflicts with the support information provided by a platform OEM or ODM, the platform documentation and configurations should take precedent.

The support guidance is dependent on the Intel® VROC and Intel® VMD versions being used in relevant platform BKC. This document is up to date for Intel® VROC revisions up to and including Intel® VROC 9.0 and Intel® VMD revisions 1.0, 2.0, 3.0, and 4.0. Please check each configuration's supporting software package before designing in.

Intel® VROC includes functional sub-products for (Intel® VMD NVMe\* RAID) and (SATA RAID). This document covers Intel® VROC (Intel® VMD NVMe\* RAID) and (SATA RAID). Refer to the [User Guides for Intel® Virtual RAID on CPU \(Intel® VROC\)](#) on the Intel® VROC support webpage for more detailed Intel® VROC use-case instructions for Windows\*, Linux\*, and VMware\* ESXi\*.



## 2 **Intel® Xeon® Support List for Intel® VMD and Intel® VROC (Intel® VMD NVMe\* RAID)**

Intel® VROC has a hardware dependency on an Intel® Xeon® feature known as Intel® Volume Management Device (Intel® VMD). Therefore, Intel® VROC is only supported on CPUs with the Intel® VMD technology. The below set of Intel® Processor families support Intel® VROC and Intel® VMD:

<b>Intel® Xeon® Processor Families that Support Intel® VROC with Intel® VMD</b>
<ul style="list-style-type: none"> <li>• Intel® Xeon® Scalable Processors (-SP, -D, -W)               <ul style="list-style-type: none"> <li>— Intel® VMD 1.0 on all SKUs</li> </ul> </li> <li>• 2<sup>nd</sup> Generation Intel® Xeon® Scalable Processors (-SP, -D, -W)               <ul style="list-style-type: none"> <li>— Intel® VMD 1.0 on all SKUs</li> </ul> </li> <li>• 3<sup>rd</sup> Generation Intel® Xeon® Scalable Processors (-SP, -D, -W)               <ul style="list-style-type: none"> <li>— Intel® VMD 1.0 on 4S/8S (-H)</li> <li>— Intel® VMD 2.0 on all other SKUs</li> </ul> </li> <li>• 4<sup>th</sup> Generation Intel® Xeon® Scalable Processors (-SP, -W, -EE)               <ul style="list-style-type: none"> <li>— Intel® VMD 3.0 on all SKUs</li> </ul> </li> <li>• 5<sup>th</sup> Generation Intel® Xeon® Scalable Processors (-SP, -W)               <ul style="list-style-type: none"> <li>• Intel® VMD 3.0 on all SKUs</li> </ul> </li> <li>• 6<sup>th</sup> Generation Intel® Xeon® Scalable Processors (SRF-SP/AP, GNR-SP/AP, GNR-W/-D/-E)               <ul style="list-style-type: none"> <li>— Intel® VMD 4.0 on all SKUs</li> </ul> </li>   <li>• All SKU Levels on -SP: Platinum, Gold, Silver, and Bronze</li> <li>• All SKU Levels on -AP: Platinum, Gold, Silver, and Bronze</li> </ul> <p>This list identifies the processors that support Intel® VROC with Intel® VMD, but this functionality must be enabled by the OEM or ODM at the platform level. Just because a processor from one of these families is used does not guarantee that the platform supports Intel® VROC with Intel® VMD. Confirm the support with the platform provider.</p> <p>Each CPU SKUs readiness on each platform, the latest updated features can contact your platform or AE accounts.</p>



### 3 Intel® Platform Support Matrix<sup>1</sup>

Intel® Xeon®	VMD Generation	Chipset	Platform Type	Platform Codename	Intel® VROC Supporting Release <sup>2</sup>	Intel® VMD NVMe* RAID	SATA RAID
Intel® Xeon® Scalable Processors	1.0	C620 Series	Mainstream	Purley	VROC 5.3	X	X
Intel® Xeon® W Processor	1.0	C400 Series	Workstation	Basin Falls	VROC 5.3	X	X
Intel® Xeon® E Processor	N/A	C240 Series	Entry	Mehlow	VROC 5.3		X
Intel® Xeon® D Processor	1.0	Integrated in CPU	SOC	Bakerville	VROC 5.3	X	X
2 <sup>nd</sup> Generation Intel® Xeon® Scalable Processors	1.0	C620 Series	Mainstream	Purley R	VROC 6.0	X	X
3 <sup>rd</sup> Generation Intel® Xeon® Scalable Processors 4S/8S (-H)	1.0	C620 Series	Mainstream	Cedar Island	VROC 7.0	X	X
3 <sup>rd</sup> Generation Intel® Xeon® Scalable Processors 1S/2S	2.0	C620 Series	Mainstream	Whitley	VROC 7.5	X	X
Intel® Xeon® D Processor	2.0	Integrated in CPU	SOC	Idaville	VROC 7.7	X	X
4 <sup>th</sup> Generation Intel® Xeon® Scalable Processors 2S/4S	3.0	C741 Series	Mainstream	Eagle Stream	VROC 8.0	X	X
4 <sup>th</sup> Generation Intel® Xeon®	3.0	W790 Series	Mainstream	Fishhawk Falls	VROC 8.0	X	X

<sup>1</sup> This matrix only covers platforms launched since Intel® VROC (VMD NVMe\* RAID) became available on Generation 1 Intel® Xeon® Scalable Processors in 2017. Some legacy platforms prior to this were supported with the previous Intel® RAID product: Intel® Rapid Storage Technology enterprise (Intel® RSTe). This support has been grandfathered into Intel® VROC but is not listed here.

<sup>2</sup> The 'Intel® VROC Supporting Release' column above identifies the Intel® VROC version introduced to support the corresponding platform. Once a supported platform is released, any following Intel® VROC releases will be supported on that platform as well. Please contact your platform provider to update the Intel® VROC software on your platform. Your platform provider can provide specific guidance on the latest Intel® VROC software release that is available for your platform.



Intel® Xeon®	VMD Generation	Chipset	Platform Type	Platform Codename	Intel® VROC Supporting Release <sup>2</sup>	Intel® VMD NVMe* RAID	SATA RAID
Scalable Processors 1S/2S							
4 <sup>th</sup> Generation Intel® Xeon® Scalable Processors - EE 1S/2S	3.0	C741 Series	Telecom	Eagle Stream	VROC 8.5	X	X
5 <sup>th</sup> Generation Intel® Xeon® Scalable Processors 2S/4S	3.0	C741 Series	Mainstream	Eagle Stream Refresh	VROC 8.5	X	X
6 <sup>th</sup> Generation Intel® Xeon® Scalable Processors 1S/2S/4S	4.0	NA/ (C741 Series) <sup>3</sup>	Mainstream	Birch Stream	VROC 9.0/9.1	X	X

Sub-Product	NVMe* SSD RAID	SATA RAID	Bootable RAID	Hot-Plug/ Surprise Removal	LED Management	3 <sup>rd</sup> Party Drive Support
Intel® VROC (VMD NVMe RAID)	X		X	X	X	X <sup>4</sup>
Intel® VROC (SATA RAID) <sup>5</sup>		X	X	X	X	X

**Table 3-1. VROC Platform Backward Compatible Table**

			VROC 6.x	VROC 7.0	VROC 7.5	VROC 8.0	VROC 8.5	VROC 9.0	VROC 10.0
Platform CodeName <sup>6</sup>	Server	Workstation							
Purley-R	X	X	<b>Target</b>	Tested	Tested	TBD			

<sup>3</sup> Birch Stream platform is a PCH removal/ Chipset-less architecture. Contact your Intel® AE for more information about additional options.

<sup>4</sup> The 3<sup>rd</sup> party NVMe drives should pass VROC validation process.

<sup>5</sup> For Birch Stream platform is a PCH removal/Chipset less architecture, the SATA RAID solutions become an optional adding supporting item.

<sup>6</sup> Each platform generation supported in VROC (target) and VROC+1 and VROC+2 (backward compatibility, tested/validated). VROC+3 is not validated.



			VROC 6.x	VROC 7.0	VROC 7.5	VROC 8.0	VROC 8.5	VROC 9.0	VROC 10.0
Platform CodeName <sup>6</sup>	Server	Workstation							
Cedar Island	X			<b>Target</b>	Tested	Tested	TBD		
Whitley	X				<b>Target</b>	Tested	Tested	TBD	
Eagle Stream	X	X				<b>Target</b>	Tested	Tested	
Eagle Stream-R	X	X					<b>Target</b>	Tested	
Birch Stream	X	X						<b>Target</b>	

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## 4 Intel® VROC SKU and Licensing Detail

Intel® VROC (VMD NVMe\* RAID) is enabled on a platform through a license mechanism that is implemented by the platform provider. The license SKU used mainly impacts the RAID levels available. The below Intel® VROC License SKUs are available:

Intel® VROC License SKUs
<p><b>Intel® VROC Pass-Thru:</b></p> <ul style="list-style-type: none"> <li>• No license needed.</li> <li>• No RAID supported; only pass-thru devices connected to Intel® VMD.</li> </ul> <p><b>Intel® VROC Standard:</b></p> <ul style="list-style-type: none"> <li>• STANDARD License needed.</li> <li>• RAID 0/1/10 supported.</li> <li>• Intel® branded NVMe* SSD support and NVMe* SSD support for NVMe* SSDs manufactured by other vendors (per <a href="#">chapter 5</a> NVMe* SSD support list)</li> </ul> <p><b>Intel® VROC Premium:</b></p> <ul style="list-style-type: none"> <li>• PREMIUM License needed.</li> <li>• RAID 0/1/10/5 supported.</li> <li>• Intel® branded NVMe* SSD support and NVMe* SSD support for NVMe* SSDs manufactured by other vendors (per <a href="#">chapter 5</a> NVMe* SSD support List)</li> </ul> <p>Self-Encrypting Drive Key Management</p> <p><b>Intel® VROC RAID 1 Only:</b></p> <ul style="list-style-type: none"> <li>• RAID 1 Only License needed.</li> <li>• RAID 1 supported.</li> <li>• Intel® branded NVMe* SSD support and NVMe* SSD support for NVMe* SSDs manufactured by other vendors (per <a href="#">chapter 5</a> NVMe* SSD support list)</li> </ul>

No licensing is needed for Intel® VROC (SATA RAID). Functionality is included with Intel® Xeon® and chipset purchase.

After the Intel® NAND business was acquired by SK Hynix\* (Solidigm\*), the Intel® SSD Only VROC SKU was removed from this list. Contact your Intel® FAE or platform vendor if you have additional questions on this change.



## **5 NVMe\* SSD Support List**

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Visit [Intel® Virtual RAID on CPU \(Intel® VROC\) NVMe SSD Support List](#) to learn more about NVMe\* SSD support with Intel VROC.

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## 6 Intel® VROC OS Support Lists

This chapter covers the operating systems that are supported by the product Intel® Virtual RAID on CPU. This means these particular OS releases can run on platforms with the given generation of Intel® Xeon® Scalable Processors (Or an Intel® Xeon® D or W Processor using the same VMD revision – check the table in [Chapter 3](#)). Other CPU level or OEM level limitations may apply that supersede this product-level OS support.

**Note:** The supporting OS list for each generation of platform was defined by its platform. For those modern released OSes, that might be working in previous existing hardware platforms but need customers to verify.

**Note: Intel® VROC OOB support:** Intel® VROC OOB (out-of-band) management is a new feature introduced with Intel® VROC revision 8.0 for use with enterprise servers, which is now supported on Windows\* and select Linux\* distributions. Intel I® VROC license is required for fully utilize this feature. Contact your Intel® AE or system OEM for more information about this feature.

For Platforms with 1 <sup>st</sup> and 2 <sup>nd</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 1.0)
<b>Linux*</b>
<p>Intel® VROC for Linux* is mostly delivered through open-source OS kernel and user space tools, with no additional software download required for specific Linux* distribution releases. It is up to specific OSV's to pull-in Intel® VROC features and patches. The distributions below have Intel® VROC support, with newer releases being more complete.</p> <p><b>Red Hat Enterprise* Linux:</b></p> <ul style="list-style-type: none"> <li>• RHEL 7.3 (Requires additional download. Contact platform provider for details)</li> <li>• RHEL 7.4 (Requires additional download. Contact platform provider for details)</li> <li>• RHEL 7.5 and newer distribution (inbox)</li> </ul> <p><b>CentOS* Linux*:</b></p> <p>CentOS* is a community-supported OS and Intel® VROC is limited in the support options for these distributions.</p> <ul style="list-style-type: none"> <li>• CentOS* is not a validated distribution for Intel® VROC.</li> <li>• If a CentOS* issue can be reproduced using the corresponding RHEL (Red Hat Enterprise* Linux) release, then the issue can be addressed.</li> </ul> <p><b>SUSE Linux* Enterprise:</b></p> <ul style="list-style-type: none"> <li>• SLES 12 SP3</li> <li>• SLES 12 SP4</li> <li>• SLES 12 SP5</li> <li>• SLES 15</li> <li>• SLES 15 SP1</li> <li>• SLES 15 SP2</li> </ul> <p>For SUSE Linux* Enterprise, Intel® VROC does not support the specific general-public Xen-Hypervisor virtualization platform.</p> <p><b>Ubuntu* Server:</b></p>



<b>For Platforms with 1<sup>st</sup> and 2<sup>nd</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 1.0)</b>
<ul style="list-style-type: none"> <li>• Ubuntu* 18.04.3</li> <li>• Ubuntu* 18.04.4</li> <li>• Ubuntu* 18.04.5</li> <li>• Ubuntu* 20.04.0</li> <li>• Ubuntu* 20.04.1</li> </ul> <p>Refer to the below link for full implementation details.  <a href="#">Intel® Virtual RAID on CPU (Intel® VROC) Configuration Guide for Ubuntu* 18.04.3/4 LTS Server</a></p>
<b>Windows*</b>
<p>Intel® VROC for Windows* is delivered through separate software download (not in OS). Reference platform provider download resources for access.</p> <ul style="list-style-type: none"> <li>• Windows* 10 (RS4/RS5/19H1/19H2/20H1/20H2/21H1/21H2/22H1/22H2)</li> <li>• Windows* 11 (SV1, SV2)</li> <li>• Windows* 2016</li> <li>• Windows* 2019 (19H1, 19H2, 20H2, 21H1, 21H2)</li> <li>• Windows* 2022</li> </ul> <p>For Windows* 7, Intel® VROC 5.6 was the last driver that supports this OS. The Intel® VROC5.6 package for Windows* 7 is delivered through the Intel® VROC 6.X installer, but the build is in sustaining mode. As of Intel® VROC 7.5 release, this Windows* 7 driver is no longer included.</p> <p>For Windows* 2012 R2, Intel® VROC 8.2 was the last driver that supports this OS. Intel® VROC 8.5 and subsequent driver versions do not support Windows* 2012 R2.</p>
<b>VMware*</b>
<ul style="list-style-type: none"> <li>• The VMware* ecosystem is supported with the same pre-OS driver that is used for Intel® VROC. In the OS/Hypervisor, Intel® VMD is supported, plus additional support for RAID 1 boot and RAID 1 data volumes.</li> <li>• ESXi* 7.0U3D and update packages</li> <li>• ESXi* 8.0 and update packages</li> <li>• There are inbox and async driver options available for Intel® VMD in VMware*. For the latest features and bug-fixes, get the async driver from either VMware* or your platform provider.</li> </ul>

<b>For Platforms with 3<sup>rd</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 2.0)<sup>7</sup></b>
<b>Linux*</b>
<p>Intel® VROC for Linux* is mostly delivered through open-source OS kernel and user space tool, with no additional software download required for specific Linux* distribution releases. It is up to specific OSV's to pull-in Intel® VROC features and patches. The distributions below have Intel® VROC support, with newer releases being more complete.</p> <p><b>Red Hat Enterprise* Linux*:</b></p>

<sup>7</sup> An exception to this list applies for platforms using **3<sup>rd</sup> Generation Intel® Xeon® Scalable 4S/8S (-H) Processors**. These platforms use VMD 1.0 technology, and OS support for these processors coincides with the OS support outlined for 1<sup>st</sup> and 2<sup>nd</sup> Generation Intel® Xeon® Scalable Processors in the previous table.

<b>For Platforms with 3<sup>rd</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 2.0)</b>
<ul style="list-style-type: none"> <li>• RHEL 7.8 (out-of-box only)</li> <li>• RHEL 7.9 (out-of-box only)</li> <li>• RHEL 8.1 (out-of-box only)</li> <li>• RHEL 8.2 and newer distribution (inbox, out-of-box package available upon request)</li> </ul> <p><b>CentOS* Linux*:</b> CentOS* is a community supported OS and Intel® VROC is limited in the support options for these distributions.</p> <ul style="list-style-type: none"> <li>• CentOS* is not a validated distribution for Intel® VROC</li> <li>• If a CentOS* issue can be reproduced using the corresponding RHEL (Red Hat Enterprise* Linux) release, then the issue can be addressed.</li> </ul> <p><b>SUSE Linux* Enterprise:</b></p> <ul style="list-style-type: none"> <li>• SLES12 SP5 (out-of-box only)</li> <li>• SLES15 SP2 and newer distributions (inbox, out-of-box package available upon request)</li> </ul> <p>For SUSE Linux* Enterprise, Intel® VROC does not support the specific general-public Xen-Hypervisor virtualization platform.</p> <p><b>Ubuntu* Server:</b></p> <ul style="list-style-type: none"> <li>• Ubuntu* 18.04.4 and newer distributions (inbox)</li> <li>• Ubuntu* 20.04 (inbox)</li> </ul> <p>Refer to the below link for full implementation details. <a href="#">Intel® Virtual RAID on CPU (Intel® VROC) Configuration Guide for Ubuntu* 18.04.3/4 LTS Server</a></p>
<b>Windows*</b>
<p>Intel® VROC for Windows* is delivered through separate software download (not in OS). Reference platform provider download resources for access.</p> <ul style="list-style-type: none"> <li>• Windows* 10 (RS3/RS4/RS5/19H1/19H2/20H1/20H2/21H1/21H2/22H1/22H2)</li> <li>• Windows* 11 (SV1, SV2)</li> <li>• Windows* 2016</li> <li>• Windows* 2019 (19H1, 19H2, 20H2, 21H1, 21H2)</li> <li>• Windows* 2022</li> </ul> <p>For Windows* 7, Intel® VROC 5.6 was the last driver that supports this OS. The Intel® VROC 5.6 package for Windows* 7 is delivered through the Intel® VROC 6.X installer, but the build is in sustaining mode. As of Intel® VROC 7.5 release, this Windows* 7 driver is no longer included.</p> <p>For Windows* 2012 R2, Intel® VROC 8.2 was the last driver that supports this OS. Intel® VROC 8.5 and subsequent driver versions do not support Windows* 2012 R2.</p>
<b>VMware*</b>
<ul style="list-style-type: none"> <li>• The VMware* ecosystem is supported with the same pre-OS driver that is used for Intel® VROC. In the OS/Hypervisor, Intel® VMD is supported, plus additional support for RAID 1 boot and RAID1 data volumes.</li> <li>• ESXi* 7.0U3D and update packages</li> <li>• ESXi* 8.0 and update packages</li> </ul>



<p><b>For Platforms with 3<sup>rd</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 2.0)</b></p>
<p>There are inbox and async driver options available for Intel® VMD in VMware*. For the latest features and bug-fixes, get the async driver from either VMware* or your platform provider.</p>

<p><b>For Platforms with 4<sup>th</sup> and 5<sup>th</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 3.0)</b></p>
<p><b>Linux*</b></p>
<p>Intel® VROC for Linux* is mostly delivered through open-source OS kernel and user space tools, with no additional software download required for specific Linux* distribution releases. It is up to specific OSV's to pull-in Intel® VROC features and patches. The distributions below have Intel® VROC support, with newer releases being more complete.</p> <p><b>Red Hat Enterprise* Linux*:</b></p> <ul style="list-style-type: none"> <li>• RHEL 8.2 (out-of-box only)</li> <li>• RHEL 8.3 (out-of-box only)</li> <li>• RHEL 8.4 (out-of-box only)</li> <li>• RHEL 8.5 (out-of-box only)</li> <li>• RHEL 8.6 (inbox only)</li> <li>• RHEL 8.7 (inbox only)</li> <li>• RHEL 8.8 (inbox only)</li> <li>• RHEL 8.9 (inbox only)</li> <li>• RHEL 9.0 (inbox only)</li> <li>• RHEL 9.1 (inbox only)</li> <li>• RHEL 9.2 (inbox only)</li> <li>• RHEL 9.3 (inbox only)</li> </ul> <p><b>CentOS* Linux:</b></p> <p>CentOS* is a community supported OS and Intel® VROC is limited in the support options for these distributions.</p> <ul style="list-style-type: none"> <li>• CentOS* is not a validated distribution for Intel® VROC.</li> <li>• If a CentOS* issue can be reproduced using the corresponding RHEL (Red Hat Enterprise* Linux) release, then the issue can be addressed.</li> </ul> <p><b>SUSE Linux* Enterprise:</b></p> <ul style="list-style-type: none"> <li>• SLES15 SP2 (out-of-box only)</li> <li>• SLES15 SP3 (out-of-box only)</li> <li>• SLES15 SP4 (inbox only)</li> <li>• SLES15 SP5 (inbox only)</li> </ul> <p>For SUSE Linux* Enterprise, Intel® VROC does not support the specific general-public Xen-Hypervisor virtualization platform.</p> <p><b>Ubuntu* Server:</b></p> <ul style="list-style-type: none"> <li>• Ubuntu* 20.04.3 (out-of-box only)</li> <li>• Ubuntu* 22.04.3 (inbox only)</li> </ul>

<b>For Platforms with 4<sup>th</sup> and 5<sup>th</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 3.0)</b>
<b>Windows*</b>
<p>Intel® VROC for Windows* is delivered through separate software download (not in OS). Reference platform provider download resources for access.</p> <ul style="list-style-type: none"> <li>• Windows* 10 (RS4/RS5/19H1/19H2/20H1/20H2/21H1/21H2/22H1/22H2)</li> <li>• Windows* 11 (SV1, SV2)</li> <li>• Windows* 2016</li> <li>• Windows* 2019 (19H1, 19H2, 20H2, 21H1, 21H2)</li> <li>• Windows* 2022</li> </ul> <p>For Windows* 7, Intel® VROC 5.6 was the last driver that supports this OS. The Intel® VROC 5.6 package for Windows* 7 is delivered through the Intel® VROC 6.X installer, but the build is in sustaining mode. As of Intel® VROC 7.5 release, this Windows* 7 driver is no longer included.</p> <p>For Windows* 2012 R2, Intel® VROC 8.2 was the last driver that supports this OS. Intel® VROC 8.5 and subsequent driver versions do not support Windows* 2012 R2.</p>
<b>VMware*</b>
<p>The VMware* ecosystem is supported with the same pre-OS driver that is used for Intel® VROC. In the OS/Hypervisor, Intel® VMD is supported, plus additional support for RAID 1 boot and RAID 1 data volumes.</p> <ul style="list-style-type: none"> <li>• ESXi* 7.0U3D and update packages</li> <li>• ESXi* 8.0 and update packages</li> </ul> <p>There are inbox and async driver options available for Intel® VMD in VMware*. For the latest features and bug fixes, get the async driver from either VMware* or your platform provider.</p>

<b>For Platforms with 6<sup>th</sup> Generation Intel® Xeon® Scalable Processors (Using VMD 4.0)</b>
<b>Linux*</b>
<p><b>Red Hat Enterprise* Linux:</b> Intel® VROC for Linux* is mostly delivered through open-source OS kernel and user space tools, with no additional software download required for specific Linux* distribution releases. It is up to specific OSV's to pull-in Intel® VROC features and patches. The distributions below have Intel® VROC support, with newer releases being more complete.</p> <ul style="list-style-type: none"> <li>• RHEL* 9.2 (out-of-box)</li> <li>• RHEL* 9.4 (out-of-box)</li> </ul> <p><b>SUSE Linux* Enterprise:</b> For SUSE Linux* Enterprise, Intel® VROC does not support the specific general-public Xen-Hypervisor virtualization platform.</p> <ul style="list-style-type: none"> <li>• SLES* 15 SP5 (out-of-box)</li> <li>• SLES* 15 SP6 (inbox only)</li> </ul>



<p>For SUSE Linux* Enterprise, Intel® VROC does not support the specific general-public Xen-Hypervisor virtualization platform.</p> <p><b>Ubuntu* Server:</b></p> <ul style="list-style-type: none"> <li>• Ubuntu* 24.04 (inbox only)</li> </ul> <p>Out-of-box available: an updated drivers/utilities package with bug fixes or enhancements from Intel is available and will be released in 9.0PV timeframe.</p> <p>Inbox only: Use the native/inbox drivers and utilities in the Linux distribution GA/GM version, without any additional updated package from Intel.</p>
<p><b>Windows*</b></p>
<p>Intel® VROC for Windows* is delivered through separate software download (not in OS). Reference platform provider download resources for access.</p> <ul style="list-style-type: none"> <li>• Windows* 10 RS5(LTS 64bit)/21H2(LTS 64bit)/22H2(64bit)</li> <li>• Windows* 11 21H2(SV1 64bit)/22H2(SV2 64bit)/23H2(SV3 64bit)/24H2(64bit)</li> <li>• Windows* Server 2016</li> <li>• Windows* Server 2019</li> <li>• Windows* Server 2022</li> <li>• Windows* Server 2025</li> </ul>
<p><b>VMware*</b></p>
<p>The VMware* ecosystem is supported with the same pre-OS driver that is used for Intel® VROC. In the OS/Hypervisor, Intel® VMD is supported, plus additional support for RAID 1 boot and RAID 1 data volumes.</p> <ul style="list-style-type: none"> <li>• ESXi* 7.0 U3D and update packages</li> <li>• ESXi* 8.0 and update packages</li> </ul> <p>There are inbox and async driver options available for Intel® VMD in VMware*. For the latest features and bug fixes, get the async driver from either VMware* or your platform provider.</p>



# 7 Supported HW Configurations

This chapter covers the configurations and platform limitations supported on the product Intel® Virtual RAID on CPU. This information covers what the Intel® VROC software can support. Platform level constraints may supersede the below:

<b>Configurations</b>	
<p>Maximum SSD Totals Supported:</p> <ul style="list-style-type: none"> <li>• 4 Direct Attached SSDs per Intel® VMD domain</li> <li>• 24 SSDs per single Intel® VMD Controller when using switches.</li> <li>• 24 SSDs per RAID 0/5 array</li> <li>• 4 SSDs per RAID10 array</li> <li>• 2 SSDs per RAID1 array</li> <li>• 96 NVMe SSDs per platform (may require switches)</li> </ul>	<p>Platform Considerations:</p> <ul style="list-style-type: none"> <li>• Up to 2 levels of switches</li> <li>• Up to 2 RAID volumes per array</li> <li>• Data volumes are supported to span across 1 or more Intel® Volume Management Device domain and CPUs.</li> </ul> <p>Boot volumes may function when spanning Intel® Volume Management Device controllers, but this configuration is not supported</p>

<b>VMWare* ESXi* Specific Configuration Limitations</b>
<p>Currently, supported RAID configurations are:</p> <ul style="list-style-type: none"> <li>• RAID 1 boot volume.</li> <li>• RAID 1 data volume.</li> <li>• Only 1 volume is supported on a given array of drives. Matrix RAID is not supported.</li> <li>• RAID 0/10/5 are not currently supported.</li> <li>• SATA RAID is not supported.</li> <li>• Boot device and data device may be attached to the same Intel® VMD Domain if vSAN is NOT implemented. Example: If not using VSAN, plug in 4 drives behind one Intel® VMD Domain/Controller. Make two RAID 1 volumes. Install the operating system on one and use the other for data.</li> <li>• If vSAN is implemented: Boot volume must be on a separate Intel® VMD Domain/Controller from data volume. Example: Boot volume (either a single device or 2-disk RAID 1 volume) is on a dedicated Intel® VMD Domain/Controller.</li> <li>• Additional scenario clarifications: <ul style="list-style-type: none"> <li>• A disk can only be used in one RAID array. If you only use part of the disk in the raid array, the rest of the disk cannot be used. (i.e., no Matrix RAID)</li> <li>• There can be more than one vSphere configured datastore on a single RAID array, but there cannot be more than one RAID array using the same disks (no Matrix RAID)</li> <li>• If vSAN is used, you cannot have both a boot datastore AND any other datastore on the same VMD controller. In other words, if you are using VSAN, you cannot have the boot datastore and a "data" datastore based on the same VMD controller.</li> <li>• If vSAN is not used, you can have a boot datastore AND "data" datastore based on the same VMD controller.</li> </ul> </li> </ul>



## 8 Switch Support List

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Intel® has engaged with the switch vendors listed below in order to support Intel® VMD and therefore Intel® VROC functionality, such as NVMe\* SSD LED management with RAID. Contact your respective switch vendor to confirm the make/models that support Intel® VMD.

Supporting Switch Vendors
<ul style="list-style-type: none"><li>• Broadcom*</li><li>• Microsemi*</li><li>• Pericom*</li><li>• Semtech*</li></ul>

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