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Intel® Virtual RAID on CPU (Intel® VROC)

Supported Configurations

Intel® VROC 7.0

This document covers the solid state drives (SSD), operating systems (OS), and configurations supported by Intel® Virtual RAID on CPU (Intel® VROC) VMD NVMe RAID. If any of this information 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 which Intel® VROC version is being used. This document is for Intel® VROC 7.0. If you are using another Intel® VROC version, please reference the Supported Configurations guide for that version.

Intel® VROC also include functional sub-products for (non-VMD NVMe RAID) as well as (SATA RAID). This document does not cover the scope for those sub-products. Please refer the Intel® VROC User Guide and Intel® VROC Name Change documents on the support page for more detail.

Intel® VROC is supported on X299 HEDT platforms, but on a more limited scope than presented in this document. Please refer to Intel® VROC X299 documentation on the support page for more detail. Some clarifying notes added below as well.

Intel® Xeon Support List

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 this Intel® VMD technology. The below list of Intel Processor families supports Intel® VROC and Intel® VMD:

Intel® Xeon Processor Families that Support Intel® VROC
• Generation 1 Intel® Xeon Scalable Processors (-SP, -D, -W) • Generation 2 Intel® Xeon Scalable Processors (-SP, -D, -W) • Generation 3 Intel® Xeon Scalable Processors (-SP, -D, -W)
This list identifies the processors that support Intel® VROC, 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 no guarantee that the platform supports Intel® VROC. Please confirm with platform provider.

Intel® VROC on X299 platforms only supports Intel® VROC Pass-thru and Intel® VROC Intel SSD Only License SKUs.

Intel® VROC SKU and Licensing Detail

Intel VROC is enabled on a platform through a license mechanism that is implemented by the platform provider. The license SKU used mainly impacts the RAID level available and which NVMe SSDs can be managed in RAID arrays. The below Intel® VROC License SKUs are available:

Intel® VROC License SKUs
Intel® VROC Pass-Thru • No license needed • No RAID Supported; only Pass-thru devices connected to Intel® VMD Intel® VROC Standard • STANDARD License needed • RAID 0/1/10 supported • Intel and 3rd Party NVMe SSD Support (per below SSD Support list) Intel® VROC Premium • PREMIUM License needed • RAID 0/1/10/5 Supported • Intel VROC Integrated Caching with Intel® Optane™ SSDs Supported • Intel and 3rd Party NVMe SSD Support (per below SSD Support List) Intel® VROC Intel® SSD Only • INTEL SSD ONLY License needed • RAID 0/1/10/5 supported • Intel VROC Integrated Caching with Intel® Optane™ SSDs Supported • Intel NVMe SSD Support only (per below SSD Support list)

NVMe SSD Support List

This section covers the SSDs that are supported on the product Intel® Virtual RAID on CPU. This includes Intel® SSDs and third-party SSDs from other vendors. Drives are listed below by product name/family and support will exist for any Form Factor (e.g. M.2 or U.2) within that product name/family. In addition, third-party SSDs not listed below may still function with Intel VROC software, but support is not provided. Therefore, the drives may or may not show up in relevant management tools and use of those drives is at the risk of the user.

The below list is Form Factor independent. Any drive listed is supported as a family, which includes any Form Factor available for that drive. However, any platform level or Form Factor level limitations supersedes Intel VROC functionality. For example, M.2 Devices do not support hot-plug or LED management, therefore, these Intel® VROC features are not support with M.2 devices.

Intel® SSDs	Third Party Vendor SSDs
All Intel® SSDs for Data Center with NVMe (including but not limited to): • Intel® SSD DC P3100 • Intel® SSD DC P3500 • Intel® SSD DC P3520 • Intel® SSD DC P3600 • Intel® SSD DC P3700 • Intel® SSD DC P4101 • Intel® SSD DC P4500 • Intel® SSD DC P4501 • Intel® SSD DC P4510 • Intel® SSD DC P4511 • Intel® SSD DC P4600 • Intel® SSD DC P4601 • Intel® SSD DC P4610 • Intel® SSD D5-P4320 • Intel® SSD D5-P4326 • Intel® SSD D5-P4420 • Intel® SSD D7-P5500 • Intel® SSD D7-P5600 • Intel® Optane™ SSD DC P4800X • Intel® Optane™ SSD DC P4801X All Intel® Professional NVMe SSDs: • Intel® SSD Pro 7600p • Intel® SSD Pro 6000p Other select Intel® SSD Series: • Intel® Optane™ SSD 900P • Intel® Optane™ SSD 905P X8 Intel® NVMe SSDs (RAID0 Support only) • Intel® SSD DC P3608 • Intel® SSD DC P4608 • Intel® SSD DC P4618	This third-party vendor SSD list is supported on any Intel® VROC capable platform. **Additional SSDs may be supported at the OEM or platform provider level**. Please contact your OEM or platform provider for a full list of third-party vendor SSDs that are supported on a given platform. Huawei • ES3500P • ES3600P Micron • 9100 Series • 9200 Series Samsung • SM951 • SM961 • PM953 • PM961 • PM963 • PM983 Toshiba • XG3 • XG5 Lenovo • Atsani Western Digital • SN720 • SN200 UNIC • P8160 E/M

Intel® VROC on X299 platforms only supports the Intel SSDs list above. The Third Party Vendor SSDs List is NOT supported by Intel® VROC on X299 platforms.

OS Support List

This section covers the operating systems that are supported on the product Intel® Virtual RAID on CPU.

Linux	Windows
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. RedHat Enterprise Linux: • RHEL 7.3 (Requires additional download. See platform provider for details) • RHEL 7.4 (Requires additional download. See platform provider for details) • RHEL 7.5 • RHEL 7.6 • RHEL 7.7 • RHEL 7.8 • RHEL 8.0 • RHEL 8.1 • RHEL 8.2 SUSE Linux Enterprise: • SLES 12 SP3 • SLES 12 SP4 • SLES 12 SP5 • SLES 15 Ubuntu Server: • Ubuntu 18.04.3 • Ubuntu 18.04.4 • Ubuntu 18.04.5 • Ubuntu 20.04.0 See below link for full implementation details. • https://www.intel.com/content/www/us/en/support/articles/000056229.html	Intel® VROC for Windows is delivered through separate software download (not in OS). Please reference platform provider download resources for access. • Windows 10 (RS3/RS4/RS5/19H1) • Windows 2012 R2 • Windows 2016 • Windows 2019 For Windows 7, Intel® VROC 5.6 was the last driver that supports this OS. The Intel VROC 5.6 package for Windows 7 will be delivered through the newest Intel VROC 6.X installer, but the build is in sustaining mode. In the future with Intel VROC 7.0, this Windows 7 driver will no longer be included.

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Supported HW Configurations

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

Configurations	
Maximum x4 PCIe SSD Totals Supported: • 4 Direct Attached SSDs per Intel® VMD domain • 24 SSDs per single Intel® VMD Controller when using switches • 24 SSDs per RAID 0/5 array • 4 SSDs per RAID10 array • 2 SSDs per RAID1 array • 48 SSDs per platform (may require switches)	Platform Considerations: • Up to 2 levels of switches • Up to 2 RAID volumes per array • Data volumes are supported to span across 1 or more Intel® Volume Management Device domain and CPUs Boot volumes may function when spanning Intel® Volume Management Device controllers, but this configuration is not supported

Switch Support List

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
• Broadcom • Microsemi • Pericom • Semtech