



# INTEL® VIRTUAL RAID ON CPU (INTEL® VROC) SUPPORT ON X299 FAQ

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## Q1: What is Intel® VROC?

A1: Intel® VROC stands for Intel® Virtual RAID on CPU. It is a bootable RAID solution specifically designed for NVMe-based solid state drives (SSDs) connected to the PCIe 3.0 lanes off of Intel processors. It is primarily targeted for professional workstations and server platforms to provide an enterprise grade RAID solution for NVMe SSDs.

## Q2: If Intel VROC is an enterprise solution, why is it supported on X299 HEDT?

A2: Intel VROC can be enabled on any platform with processors that support the Intel® Volume Management Device (Intel® VMD) feature, which the X299 chipset has. Since RAID is still applicable to high end desktop (HEDT) users, Intel VROC was migrated to this client chipset to provide a RAID alternative.

However, Intel VROC support on HEDT has moved to sustaining mode and Intel® Rapid Storage technology (Intel® RST) is the primary storage solution for this platform. Please check with your X299 HEDT motherboard vendor for specific details.

The X299 HEDT desktop and the Intel® VROC support described here is related to platforms that contain Intel® Core X-series processors and an Intel® 200 Series Chipsets.

Primary Intel® VROC functionality is designed for use on Intel® Xeon Scalable Processors. For more details, please review the standard documentation on [www.intel.com/vroc](http://www.intel.com/vroc) and on the Intel(R) VROC support page.

## Q3: What is the difference between Intel RST and Intel VROC? When should I use one versus the other?

A3: For a detailed comparison between Intel RST and Intel VROC please see this RAID solutions technology brief:

<https://www.intel.com/content/dam/www/public/us/en/documents/technology-briefs/client-raid-and-dc-raid-solutions-technology-brief.pdf>

In summary, Intel RST is targeted for lower queue depth client workloads while Intel VROC is targeted for high queue depth enterprise workloads. This is why X299 HEDT users should use Intel RST over Intel VROC.

In no situation should Intel RST and Intel VROC be used on the same platform at the same time. This use is non compatible with the platform and is not supported.

## Q4: Is Intel VROC software or hardware RAID?

A4: Intel VROC is a hybrid RAID solution.

It has attributes like hardware RAID because of the key silicon feature called Intel VMD which is offered with the new Intel® Core™ X-series family of processors. Intel VROC utilizes Intel VMD to aggregate NVMe SSDs allowing bootable RAID. Intel VROC also has attributes like software RAID. For instance: it



uses some of the CPU cores to calculate the RAID logic. Because of this combination of software and silicon, Intel VROC is called a hybrid RAID solution.

**Q5: Does Intel VROC support third party SSDs on the X299 platform?**

A5: No. Intel VROC on X299 platforms supports Intel® SSDs only.

**Q6: What is Intel VROC hardware key?**

A6: Intel VROC is a licensed product for sale through OEMs or ODMs with a support service level agreement. The Intel VROC hardware key is the mechanism to obtain a license to the Intel VROC software. Certain OEMs/ODMs have platforms that support Intel VROC by adding an HW key header to their motherboards. The Intel VROC hardware key is required to be inserted into that motherboard to enable the RAID license. Only one key is needed per system.

**Q7: What is the Intel VROC SKU supported on X299?**

A7: The Intel VROC SKU supported on X299 is:

- **Intel VROC-Intel SSD only SKU (VROCISSDMOD):** RAID 0/1/5/10 support on Intel SSDs only.

**Q8: Where can I get an Intel VROC hardware key?**

A8: With Intel® VROC moving into sustaining mode on X299 HEDT platforms, the Intel® VROC hardware keys will no longer be actively sold to X299 customers. Please use Intel® RST instead which does not require a hardware key.

**Q9: Which OEM or ODM has designed in Intel VROC?**

A9: Several OEMs and ODMs have designed Intel VROC into their X299 platforms. Please query OEM or ODM platform provider directly.

**Q10: How is Intel VROC different from Intel® RSTe?**

A10: Intel VROC is the new name for the previous Intel® Rapid Storage Technology Enterprise (Intel® RSTe) storage driver family. Please see the document “Intel® VROC and Intel® RSTe Name Change Explained” for more detail.

**Q11: How can I try Intel VROC?**

A11: If you do not currently use Intel® VROC on your X299 HEDT platform, it is not recommended to start using it now. Please instead try Intel® RST.

**Q12: I found RAID 0 works without Intel VROC HW key. But the product brief is saying I need VROC HW key for RAID 0. What should I do?**

A12: An Intel VROC HW key is required to use RAID 0/1/5/10 for most SSDs. However, Intel VROC is also designed to provide RAID 0 for x8 PCIe Intel® NVMe SSDs without requiring HW key. For instance: Intel® DC P4608 SSD. For any other regular x4 SSDs, without HW key, RAID0 may work, but is not supported. In short, an Intel VROC HW Key is required for official support for RAID0 with regular x4 SSDs.

**Q13: What Operating Systems are supported by VROC on X299?**

A13: Windows 10 is the only OS supported by VROC on chipset X299



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