Intel® VROC Performance with Gen5 NVMe* SSD

Customer Communication

WW15, April 2025

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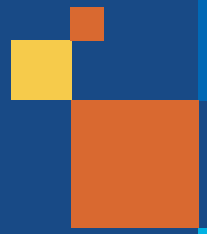

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Revision History

Revision	Description	Revision Date
WW15, 2025	Initial Release	April 2025

Customer Communications: Intel® VROC Windows* Performance Limitations Exposed with Gen5 NVMe* Drives

Customers running Intel® VROC under a Microsoft* Windows environment, using Gen5 NVMe* SSDs, may not see the expected performance benefits when running in a RAID 0 configuration. Customers generally utilize a RAID 0 configuration to achieve (and expect to see) a linear scaling of the aggregate bandwidth of the RAID member drives. Running in this configuration, customers may see approximately 60% of that value.

This is a result of limitations in the Intel VROC driver's Windows* Storport miniport driver model architecture. The improved capabilities of the Intel CPUs, combined with the speed of the Gen5 NVMe* SSDs, have exposed these architectural limitations. Intel will continue to work on incremental improvements although it is unlikely that these changes will achieve the expected results.

Running in the above configuration, other Intel® VROC RAID levels may yield lower than expected performance results. Intel has not and does not plan to perform extensive Intel VROC Windows* based performance analysis using Gen5 NVMe* SSDs. Therefore, the Intel® VROC Windows* solution's complete performance capabilities remain are currently not available.

Microsoft* is aware of Windows* Storport miniport driver model limitations and is planning on introducing new StoreMQ architecture that will focus on low-latency high performance multi-queue storage hardware, such as NVMe* technology.

Lee, Scott. "NVM Express® (Nvme®) Innovations in Windows." https://files.futurememorystorage.com/proceedings/2024/20240807_SPOS-201-1_NVM_Express_Lee.pdf, 15 Aug. 2024, files.futurememorystorage.com/proceedings/2024/20240807_SPOS-201-1_NVM_Express_Lee.pdf


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