Today’s data hungry business processes need access to data quicker than ever. Quicker access to data means faster decision making, better productivity, and quicker ROI on IT infrastructure. Therefore, Enterprise data storage solutions are migrating to higher bandwidth and lower latency NVMe*-based SSDs to address the performance bottlenecks of legacy SATA/SAS interfaces. With this transition, enterprises also require RAID data protection for NVMe SSDs.

Intel® Virtual RAID on CPU (Intel® VROC) is a new enterprise RAID solution specifically designed for NVMe SSDs that provides expected reliability, while unleashing the performance of NVMe SSDs. This is made possible by a new feature in next-generation Intel® Xeon™ Scalable processors called Intel® Volume Management Device (Intel® VMD), an integrated controller inside the CPU PCIe* root complex. Because the NVMe SSDs are directly connected to the CPU, the full performance potential of reduced latency and increased bandwidth can be realized. Intel VROC enables this benefit without the complexity, cost and power consumption of traditional hardware RAID HBA cards placed between the drives and the CPU.

Scalable RAID for Growth on Demand

A single Intel Xeon Scalable processor using Intel VROC is capable of supporting up to 12 NVMe SSDs directly attached to the CPU, and up to 6 RAID arrays. On dual-socket system configurations, that amount doubles. In addition, Intel VROC supports both boot volumes and data volumes, enabling the flexibility to use one array for both system and data volumes, or separating the arrays respectively. Although a boot RAID array needs to be within a VMD controller, data RAID arrays can span across multiple Intel VMD controllers, or even span across different processors on the same system. With a multitude of supported configurations, Intel VROC allows NVMe RAID solutions to start small, then scale simply and cost effectively.

Rich Management Tools for Easy Maintenance

Intel VROC management tools support today’s modernized data center infrastructure. Intel VROC allows data center administrators to create and delete RAID volumes in both pre-OS and OS environments. RAID settings can be configured using either a user interface or command line, plus the arrays can be managed locally or remotely through a web-based RESTful agent.

NVMe-based SSD management has never been easier. There is no need to reboot the server to replace a failed drive any longer because surprise hot-plug is supported. Using the status indicator LED, administrators can visually identify the RAID status (i.e. normal, initialization, degraded, or fail), as well as locate a particular drive in hundreds of SSDs. Email notification will alert administrator, should any alarming events occur.
Reliable RAID for Data Protection

For enterprise, it’s critical to protect data when power loss occurs unexpectedly. Intel VROC takes that to a step further. The data will even be safe when RAID 5 is in degraded state and power loss occurs at same time. Most RAID solutions avoid this problem by requiring a backup power unit, which adds additional cost. Intel VROC solves this double fault challenge using a patent-pending journaling process without the need of backup power unit.

Note: Intel® VROC RAID 5 double fault protection feature depends on state-of-the-art data center NVMe SSDs with power loss protection.

Unleash the Power of NVMe SSDs Today

Quicker access to data means a more efficient business and upgrading to NVMe SSDs is the first step to a faster storage solution. Unleash the full power of these NVMe SSDs with Intel Virtual RAID on CPU, a complete RAID solution that enables the unprecedented speed of NVMe SSDs, while knowing that your data is protected for enterprise applications.

Features at a Glance

<table>
<thead>
<tr>
<th>Supported Platform</th>
<th>Platforms with Intel® Xeon® Processor Scalable family processors, Intel® Xeon® W processors, or Intel® Xeon® D processors</th>
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</thead>
<tbody>
<tr>
<td>Supported Configurations</td>
<td>For current list of supported NVMe SSDs, Operating Systems, and configurations, please reference the Intel® VROC Support page at: <a href="https://www.intel.com/content/www/us/en/support/articles/000030310/memory-and-storage/ssd-software.html">https://www.intel.com/content/www/us/en/support/articles/000030310/memory-and-storage/ssd-software.html</a></td>
</tr>
<tr>
<td>SKUs Available</td>
<td>Intel VROC Standard: RAID 0/1/10; 3rd Party SSD Support Intel VROC Premium: RAID 0/1/5/10; 3rd Party SSD Support Intel VROC Intel SSD Only: RAID 0/1/5/10; No 3rd Party SSD Support</td>
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</table>
| Key Features             | • Bootable RAID  
|                          | • RAID controller spanning for data volumes  
|                          | • Management Tools (UEFI CLI, UEFI HII, OS CLI, GUI, Remote Webpage)  
|                          | • Surprise Hot-plug  
|                          | • Status LED Indication  
|                          | • Hot Spare and Auto-rebuild  
|                          | • Email Notifications for RAID events  
|                          | • RAID 5 Power Loss Protection for Degraded Volume (Double Fault Protection)  
|                          | • Bad Block Management  
|                          | • Various Strip Sizes (4k, 8k, 16k, 32k, 64k, 128k) |