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Product Brief

Marvell® 88SS5000 NVMe-oF™ SSD Controller

Supports scalable, high-performance disaggregation of storage from compute

Overview

The Marvell® 88SS5000 is the industry's first NVMe-oF™ Ethernet SSD controller, a highly integrated solution designed to save power, board space and cost compared to discrete solutions. The breakthrough controller provides an innovative architecture that increases utilization and scalability of SSDs within the data center to ultimately lower total cost of ownership. By bringing low latency access over the fabric and exposing the entire SSD bandwidth to the network, the 88SS5000 enables true scalable high-performance disaggregation of storage from compute. It does this by using an Ethernet fabric instead of a PCIe® fabric controlled and managed by a powerful CPU.

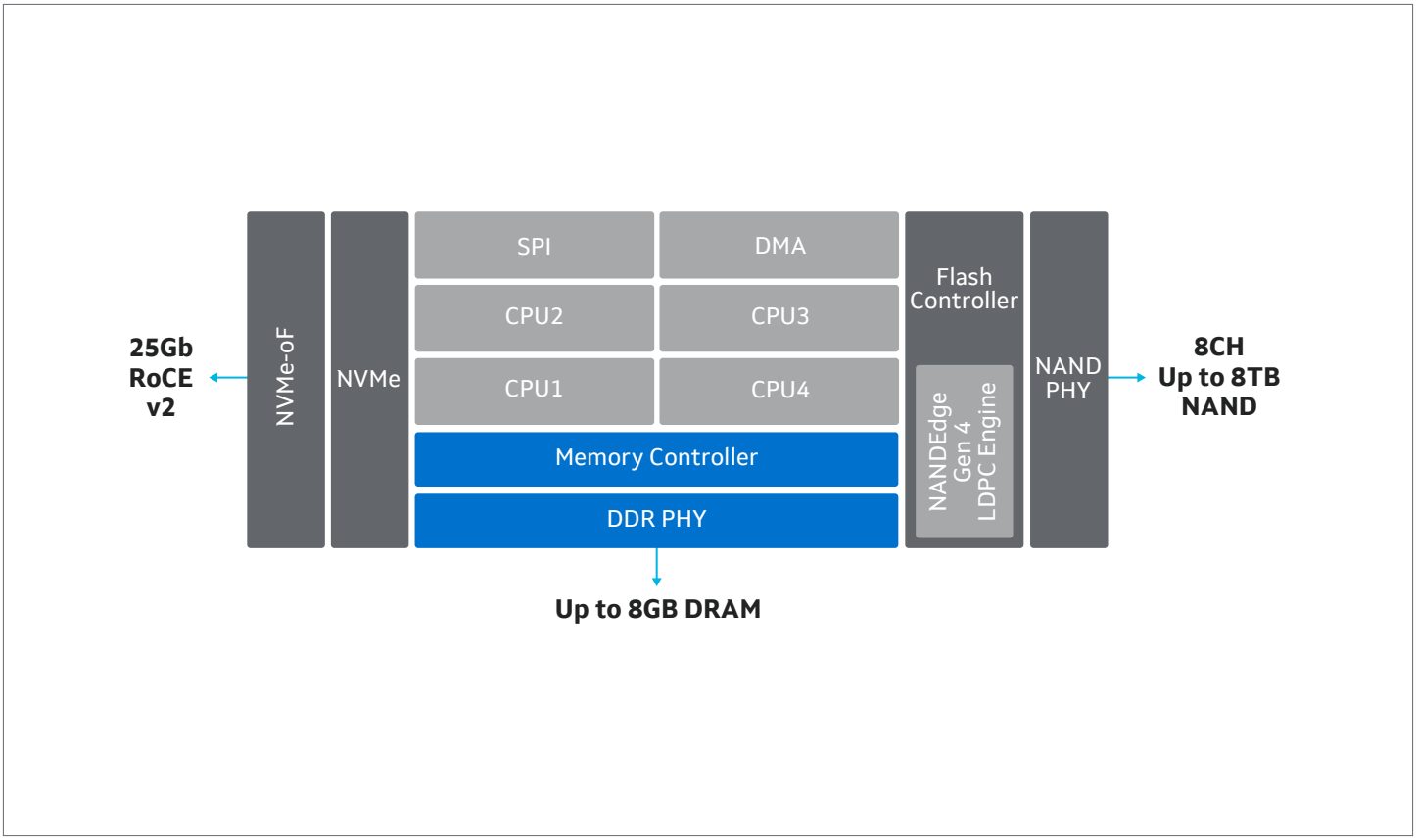
The 88SS5000 can also be used in Ethernet Bunch of Flash (EBOF) storage appliances. In a typical high-end 2U24 shelf with Gen3x4 SSDs, the solution can support up to 18M IOPS.

Utilizing a Marvell Ethernet switch that supports 2Tb/s and the NVMe-oF SSD controller, data center operators can benefit from a 150GB/s pipe of pooled storage, and better power consumption per IO compared to general purpose architectures.

For enterprise use cases, the NVMe-oF SSD controller supports a 25Gb dual port (active/active) RoCE v2 (RDMA over converged Ethernet) interface to enable high availability systems.

The controller leverages Marvell's fourth generation NANDEdge™ LDPC engine for extracting the highest performance from TLC and QLC NAND while providing the most P/E cycles. The NVMe-oF controller also supports TCG tandards including an AES engine and OTP storage for secure drive configuration.

Block Diagram



Key Features

Features	Benefits
Processor	• Quad Cortex®-R5 CPUs • Dynamic Branch Prediction • DMA controller
NVMe-oF Interface	• Dual port 25Gb RoCE v2 interface
DDR Controller	• Up to 8GB DDR3, DDR4, LPDDR3, LPDDR4 at speeds up to 2400MT/s with ECC support
Flash Controller	• 8 Channels @ 800MT/s • ONFI 2.2/2.3/3.0/4.0, JEDEC mode and Toggle 1.0/2.0 • Hardware RAID • Marvell NANDEdge Gen4 LDPC engine
NVMe	• NVMe™ Standard Revision 1.3 compliance • 256 outstanding I/O commands • 132 total queue pairs • 64 Virtual Functions • MSI and MSI-X interrupt mechanisms • T-10 DIF and end-to-end protection
TCG	• OTP support for secure drive configuration • AES encryption hardware • Media re-encryption hardware
Package	• Available in standard 21x21mm (961 ball) BGA package

Target Applications

- NVMe-oF SSDs
- Cloud Storage Servers
- Edge Computing; Automotive Centralized Storage

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Marvell first revolutionized the digital storage industry by moving information at speeds never thought possible. Today, that same breakthrough innovation remains at the heart of the company's storage, networking and connectivity solutions. With leading intellectual property and deep system-level knowledge, Marvell semiconductor solutions continue to transform the enterprise, cloud, automotive, industrial, and consumer markets. For more information, visit www.marvell.com.

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