



## SOLUTION BRIEF



# xiRAID Superfast RAID Engine for NVMe SSD on Arm-Based BlueField3 DPU

## XINNOR

### ARM IP

+Cortex-A

### OVERVIEW & GOAL

Xinnor is an Israeli-based software company that specializes in data storage solutions. Our main product is xiRAID, a patented software RAID engine that delivers exceptional performance. By focusing on disaggregated high-performance storage on the NVIDIA BlueField3 DPU provided by xiRAID, we ensure high performance, security, and cost-effectiveness.

By offloading RAID calculations to the BlueField3 DPU, which integrates 16 Armv8.2+ CPU cores, we enhance efficiency and flexibility within datacenter environments. This strategic utilization of Arm processors not only improves performance but also reduces CPU utilization and consequently drastically reduces power consumption while enhancing scalability.





#### APPLICATION AREA

- + Artificial Intelligence
- + Server and Infrastructure
- + Storage

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There are multiple benefits of building disaggregated storage with BlueField3 DPU and xiRAID . Firstly, it helps ensure security without the need for specialized software or hardware installation, reducing complexity for users. Secondly, it offers cost savings by minimizing CPU consumption and eliminating the need for third-party storage solutions. Moreover, the disaggregation feature allows for dynamic changes in storage capacity, facilitated by SNAP technology, which helps simplify management and eliminate NVMe-oF complexities.

This solution brings unparalleled advantages to cloud providers, research labs, and enterprises.

#### CHALLENGE

With the advent of data-intensive applications, such as AI, machine learning, big data, and relational databases, accessing data at high speed is becoming more and more critical. Storage media vendors managed this requirement by introducing NVMe SSD as a faster alternative to legacy media and interfaces. NVMe SSD provides higher bandwidth, higher IOPS, and reduced latency. On the other hand, traditional RAID implementations cannot keep up with new storage media performance. For this reason, xiRAID was designed from the ground up to provide the fastest possible RAID protection to NVMe SSD drives. The other challenge when running these data-intensive applications is that power is never sufficient. By offloading RAID calculations from the host CPU to the Arm-based DPU, Xinnor is drastically reducing the power consumption required to handle data storage.

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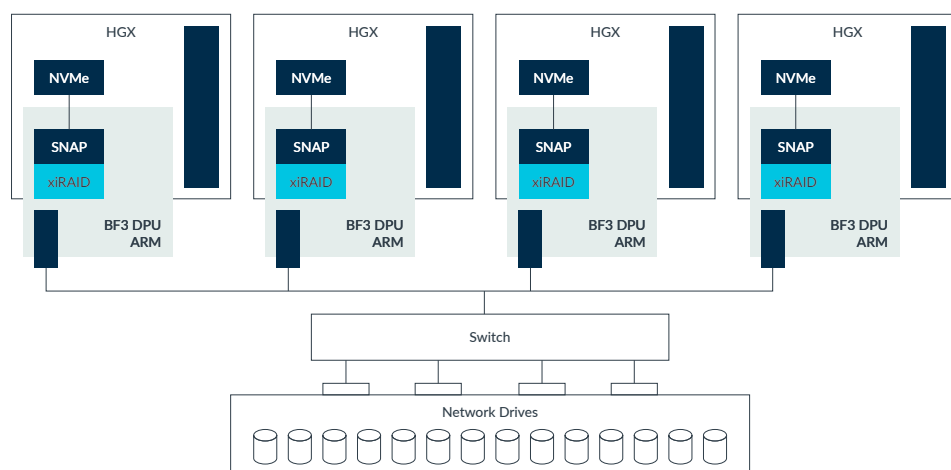
## SOLUTION AND BENEFITS

The Xinnor xiRAID solution delivers exceptional performance and versatility, as demonstrated by rigorous testing. Utilizing 6x Samsung PM9A3 3.84TB NVMe drives connected via the nvme-rdma driver over a high-speed 200Gbit/s InfiniBand port, xiRAID achieves remarkable results. With workloads efficiently running on BlueField3 in Fio plugin SPDK mode, our solution consistently reaches 60% to 100% of theoretical maximum performance in both RAID5 and RAID6 configurations.

	Sequential Write (GB/s)	Sequential Read (GB/s)	Random Write (K IOPS)	Random Read (K IOPS)
Raw Drives	16	24	2,064	4,064
xiRAID, RAID5	11	24.6	447	2,351
xiRAID, RAID6	8.2	24.5	328	2,352

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xiRAID running on DPU is changing the paradigm of storage implementation at scale. Now, cloud customers can connect NVIDIA SuperPod GPU systems to drives connected over the network, without the need for dedicated storage servers. By eliminating the need of dedicated servers, xiRAID significantly reduces the cost of deploying fast storage and the associated power requirement. Moreover, xiRAID seamlessly integrates with any host operating system and hypervisor, ensuring compatibility and ease of deployment across diverse environments. With xiRAID, organizations can confidently optimize their storage infrastructure, maximizing performance and efficiency, while minimizing complexity.



#### LINKS TO FURTHER RESOURCES

– [Learn more about xiRAID](#)