NVMe IP core Series

Direct Connection to PCIe Gen5 SSD for Versal FPGA

The NVMe-IP Core series is an IP core that interfaces with PCIe SSDs without requiring a CPU or external memory. It is ideal for storage applications demanding ultra-high-speed performance at gigabytes per second and capacities ranging from hundreds of gigabytes to terabytes. By enabling GB/s-level data transfers with a single SSD—previously achievable only through multiple SSDs in a RAID setup—this core contributes to system compactness and efficiency.

A reference design for AMD FPGAs is included as a standard feature, helping to accelerate product development. Additionally, free demo files for AMD FPGA evaluation boards are available, allowing users to test and evaluate the core on real hardware before purchase.

Features

- Implement application layer to access NVMe PCIe SSD without CPU and external memory (DDR)
- Support SMART, Shutdown, FLUSH,Secure Erase Command * Optional Support: Write Zero, Sanitize command
- CPU-Free exFAT/FAT32 Access * optional
- Support PCIe switch * customize support
- Free evaluation before purchasing

CPU & External Memory Not Required

Simple Interface

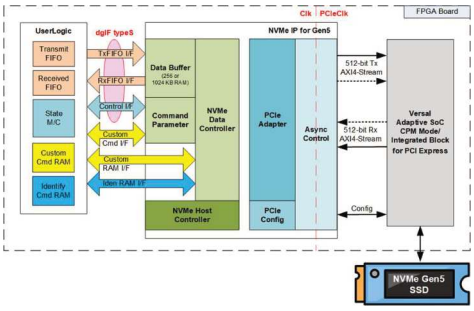
Proven Reference Design

Rich Documents

Line up & Options

NVMe IP core

NVMe IP core Supports PCIe Gen5 SSDs on **Versal** Devices.



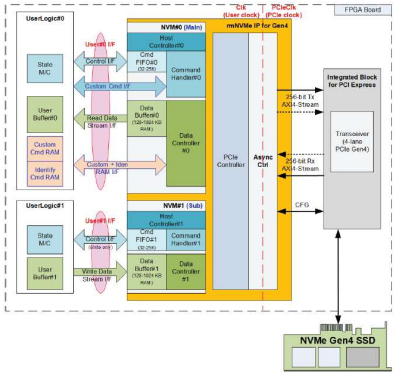
Available Reference Designs & Optional IP

- 2ch/4ch RAID0
- Sustain Rate with DDR
- exFAT/FAT32
- PCIe Switch
- Optional Command

rmNVMe IP core

Random Access & Multi User

rmNVMe IP core is designed and optimized for simultaneous random access by multiple users.



Single-user random write access achieves over **1600K IOPS**. * PCIe Gen4

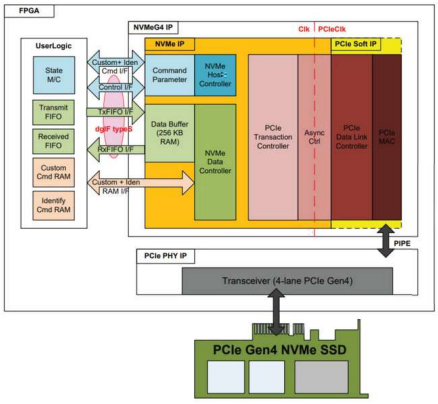
Write 741K IOPS

Read 741K IOPS

NVMeG4/G3 IP core

built-in PCIe Gen3/4 Soft IP

NVMeG4/G3 IP core features with built-in PCIe Soft IP, making it ideal for devices without or with limited PCIe Hard IP.



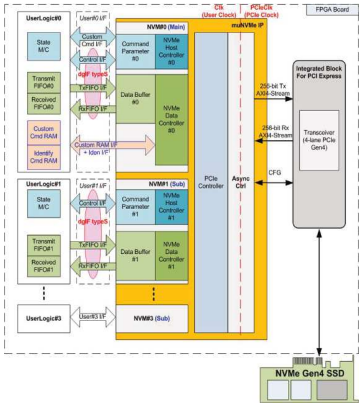
Compact Resource & Cost advantage

muNVMe IP core

MULTI USER

muNVMe IP core is designed and optimized to allow simultaneous access to NVMe SSDs from up to four users.

It enables concurrent read operations while simultaneously recording data from multiple sources.



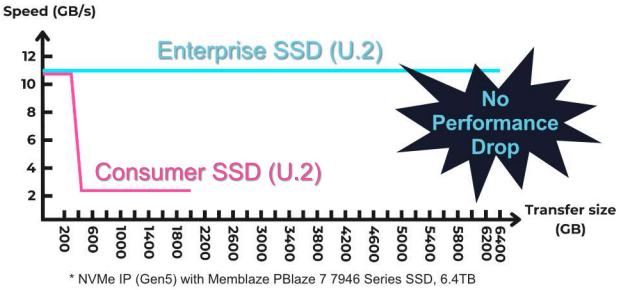
Simultaneous 4-User Sequential Read/Write

Write 1894 MB/sec x2 users

Read 1900 MB/sec x2 users

Blazing Fast & Sustained Performance

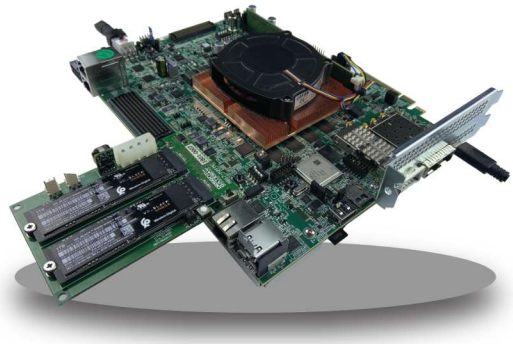
Free Evaluation Demo of NVMe-IP PCIe **Gen5**
with Enterprise SSD on Versal™ HBM VHK158

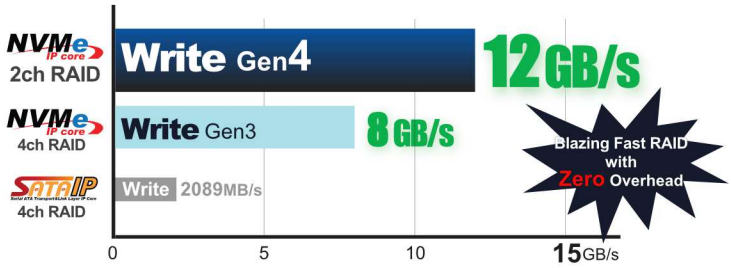


* NVMe IP (Gen5) with Memblaze PBlaze 7 7946 Series SSD, 6.4TB

Enables Sustained Recording
of **6.4TB** Full Disk at **11,000**MB/sec

Free Evaluation of NVMe-IP PCIe **Gen4**
2-Channel RAID0 with Versal™ AI Core VCK190





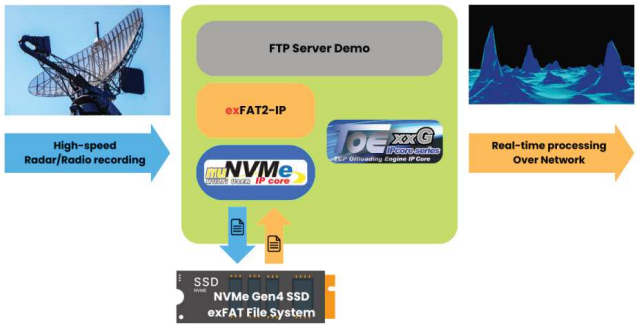
* NVMe IP (Gen4) with WD Black SN850 2pcs
* NVMe IP (Gen3) with Samsung 960Pro 2pcs + 970Pro 2pcs

Able to Build PCIe Gen4 SSD RAID Systems!

Suitable Applications

MANUFACTURING & EQUIPMENT	TEST & MEASUREMENT	AUTOMOTIVE	MEDICAL	AEROSPACE	BROADCASTING & MEDIA
					
Data Logger	4K/8K Display tester Image Measuring Device	LiDAR	High resolution CT scanner	Satellite tracking station	4K/8K Video Recording System

Example of Data Storage Systems Using muNVMe-IP



Applications Requiring Simultaneous Read/Write Access or Multiple Write Access

Detailed technical information, including datasheets, is available on our website https://dgway.com/en/amd/nvme-ip.html