PAE Solution Bundles

PCIe ACCELERATOR EXPANSION FOR 1U & 2U SERVERS & WORKSTATIONS

PCIe Clearance | PCIe Bandwidth | Power | Cooling | Acoustics



RocketStor 8631DH

Compute & NVMe Storage Expansion Solution

Direct GPU-to-Storage P2P Routing

HighPoint PCIe Accelerator Expansion (PAE) Solution Bundles eliminate physical deployment barriers associated with 1U/2U servers and workstations by relocating accelerators into dedicated external chassis. Using only a single-width PCIe slot, the solutions connects your platform to a RocketStor 8631D enclosure via a high-speed CopprLink™ cable. This architecture leaves neighboring server slots open for networking and storage, while the RocketStor 8631D enclosure independently powers and cools the 600W+ GPU at a quiet 65.9 dBA—protecting your server from heat, noise, and electrical strain.

The RocketStor 8631DH enables a single multi-slot accelerator, such as NVIDIA® BWE GPUs, to directly interface with internal front-panel hosted NVMe storage within existing enterprise servers and workstations without compromising internal PCIe slots. The Rocket 7638D hybrid host card installs cleanly into a single PCIe slot integrating an external 64 GB/s CopprLink port with dual internal MCIO x8 ports (SFF-TA-1016) for direct connectivity to front panel NVMe storage backplanes.

By establishing native PCIe Gen5 Peer-to-Peer (P2P) DMA switching across its downstream ports, the onboard 48-lane switch fabric allows NVMe storage to stream directly into GPU VRAM across a local hardware crossbar, eliminating host CPU memory bounce buffers and substantially reducing CPU I/O overhead.

Feature Highlights

- Enables a single Full-length, triple-slot accelerator up to to interface directly with NVMe storage via a dedicated PCIe Gen5 x16 connection
- Designed to address the power, acoustic, thermal & dimensional challenges of hosting multi-width accelerators in standard 1U/2U server & workstation environments.
- Compact Switch Adapter is easily integrated into standard riser slots without compromising neighboring slots.
- Moves Power & Thermal load outside of the server chassis with independent 1300W CRSP PSU & acoustically-tuned dual-fan cooling system.

Facilitate Direct GPU to NVMe Storage Connectivity Without Replacing Your Server



1 | Physical Clearance & PCIe Slot Starvation - Modern multi-slot accelerators cannot fit inside standard 1U chassis and mechanically obstruct 2-3 adjacent slots in many conventional 2U risers. This can lead to severe slot starvation, leaving limited physical space for internal NVMe storage HBAs or high-speed clustering NICs.

The RocketStor 8631DH Solution: The single-width Rocket 7638D host adapter occupies a single riser slot, converging an external CopprLink port and dual internal MCIO x8 NVMe storage ports onto a single PCIe Gen5 x16 host connection. It externalizes the multi-slot GPU while simultaneously driving internal NVMe storage (direct-attached for up to four drives, or via switched UBM backplanes for up to 16 drives), preserving remaining slots for 100GbE/200GbE NICs.



2 | Host Server Power Delivery Constraints - 600W GPUs introduce substantial power load on the host PSU and auxiliary GPU power connections. Under demanding workloads, transient power excursions can challenge power thresholds in certain compact platforms, potentially risking power throttling or Over-Current Protection (OCP) shutdowns.

The RocketStor 8631DH Solution: The accelerator's 600W+ footprint is powered entirely by the RocketStor 8631D enclosure's independent 1300W CRPS PSU. This isolates the host from high-power demands and transient current spikes.



3 | Host Chassis Thermal & Acoustic Burden - Dissipating 600W+ of trapped GPU heat significantly increases internal cooling demands. To prevent thermal throttling, fans frequently ramp up to aggressive high-speed profiles, generating intrusive acoustic whine that disrupts noise-sensitive engineering labs, edge IT closets, or office-adjacent equipment rooms.

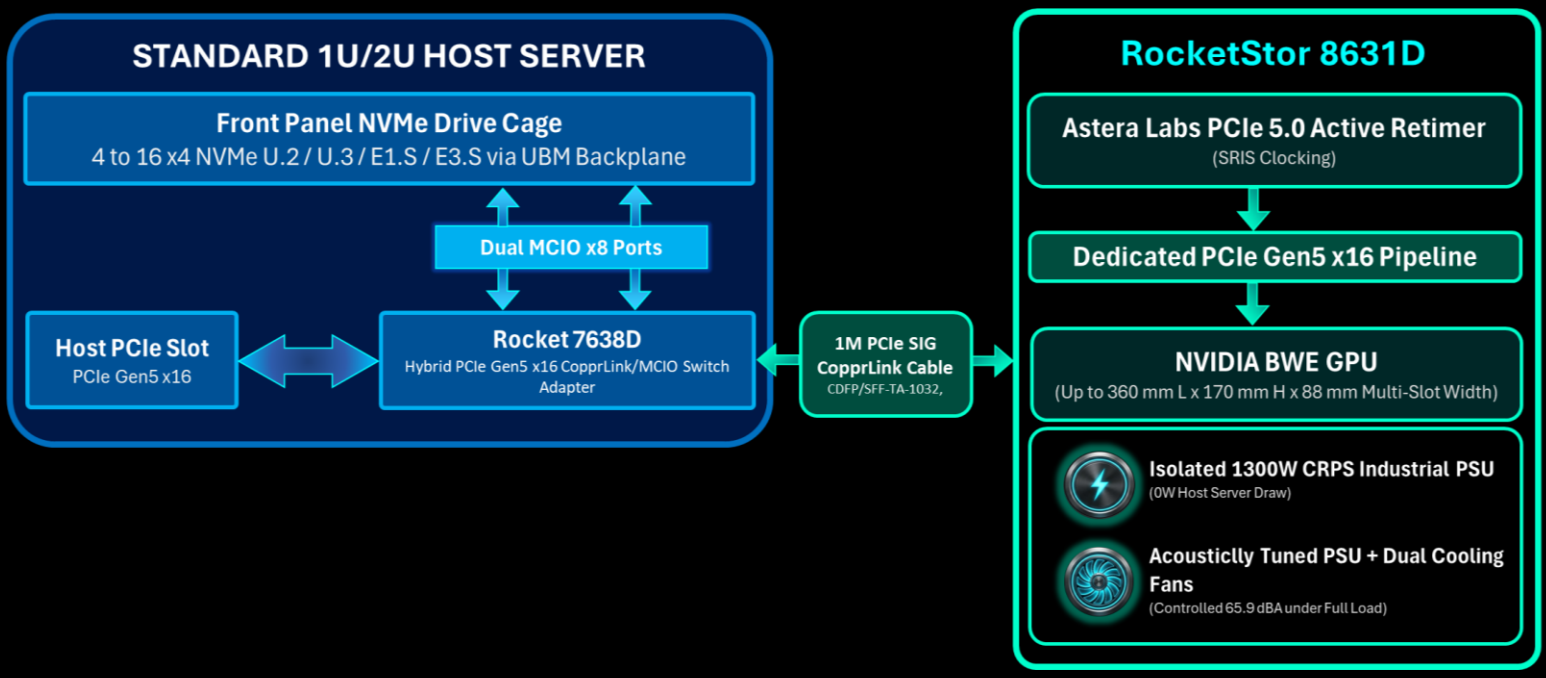
The RocketStor 8631DH Solution: Relocating the 600W-class GPU's thermal load outside the host reduces internal cooling demands and helps minimize aggressive chassis fan operation. The RocketStor 8631D enclosure incorporates an acoustically tuned industrial PSU and dedicated cooling fans, delivering a measured 65.9 dBA at 1m.



4 | GPU-to-NVMe Data Movement Bottlenecks - In traditional server storage architectures, streaming high-resolution datasets from NVMe storage into GPU memory requires intermediate CPU management and system RAM bounce buffers. This host memory staging consumes substantial host CPU cycles, introduces latency, and caps overall ingestion throughput.

The RocketStor 8631DH Solution: The onboard 48-lane PCIe Gen5 switch core establishes a native, hardware-level crossbar switching fabric between the internal MCIO NVMe ports and the external GPU port. By enabling direct peer-to-peer DMA transfers across the local switch fabric, storage data bypasses host CPU root complexes and system RAM bounce buffers entirely. This architecture substantially frees host CPU compute cycles for preprocessing and application logic while minimizing end-to-end data transfer latency.

RocketStor 8631DW Solution Architecture



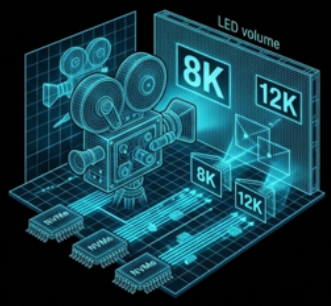
Application Deployment Ideas

3D Medical Imaging (Cryo-EM, CT/MRI)



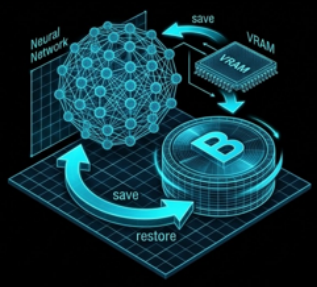
Direct streaming of multi-gigabyte tomographic datasets from front NVMe scratch volumes to GPU memory, cutting 3D mesh rendering and slice reconstruction cycles by up to 60%.

8K/12K Virtual Production



Real-time display multi-camera rendering and uncompressed 8K/12K video raster playback without frame drops, sustained by line-rate NVMe-to-VRAM transfers.

High-Throughput Model Checkpointing



Accelerated checkpoint save and restore cycles in multi-billion parameter model execution, minimizing training pipeline pauses by offloading I/O management from the host CPU.

Edge Multi-Sensor Fusion & Autonomous Telemetry



Direct streaming of multi-gigabyte tomographic datasets from front NVMe scratch volumes to GPU memory, cutting 3D mesh rendering and slice reconstruction cycles by up to 60%.

Specification	RocketStor 8631DH: PAE Compute & NVMe Storage Bundle
Packaging & Retail Model	RocketStor 8631DH (Single Retail Box)
Hardware Core Topology	1:1 Compute + NVMe Storage Fabric
Included Host Interface Card	1x Rocket 7638D Host Switch Card
Host Switch Architecture	Broadcom 48-Lane PCIe Gen5 Switching Technology
Host Interface & Data Rate	PCIe 5.0 x16 (64 GB/s line-rate; backward compatible with Gen4)
Host Riser Form Factor	Low-Profile (68.9 mm x 165 mm); Single-width
Included Brackets	Full-Height & Low-Profile Brackets
External Interconnect Ports	1x External CDFP Port (Dedicated PCIe 5.0 x16)
CopprLink Compliance	PCI-SIG CopprLink compliant (CDFP Pinout / SFF-TA-1032)
Internal NVMe Storage Ports	2x Internal MCIO x8 Ports (Default 4x4 mode; UBM & VPP ready)
Storage Device Compatibility	Direct support for PCIe NVMe SSDs (U.2, U.3, E1.S, E3.S, PCIe AIC)
Included Enclosures	1x RocketStor 8631D Enclosure
Signal Retiming Technology	Astera Labs PCIe 5.0 Active Retimer
GPU / Accelerator Slots	1x PCIe 5.0 x16 Slot (GPU not included)
Supported Accelerator Clearance	Up to 370 mm (L) x 170 mm (H) x 88 mm (W) (Full-length, triple-slot cards)
Accelerator Compatibility	NVIDIA Blackwell RTX PRO 6000, Ada Lovelace RTX 6000, or any Gen5/Gen4 Workstation GPU
Dedicated Enclosure Power	1x Integrated 1300W CRPS Industrial PSU
Sustained GPU Power Capability	600W+ sustained
Included GPU Power Cables	1x 12VHPWR to Dual 8-Pin (2x4) Power Cable
Host Power Isolation	100% Externalized GPU Power
Acoustic Noise Profile	65.9 dBA under sustained 100% full load
Cooling & Fan Controls	Automated Smart Fan (Linear ramp 65°C–75°C, Full >75°C) & 5 Manual Preset Speeds
Hardware Fault Buzzer Alert	Audio alerts for Fan Failure (<100 RPM) & Retimer Overheat (>100°C) with rear Mute button
Driver & Software Architecture	100% Driverless: Native In-Kernel OS Support (No proprietary host drivers required)
Operating System Support	RHEL, Rocky Linux, Ubuntu Server LTS, Proxmox VE, Windows Server 2022/2025
Direct DMA & Ingestion Protocols	NVIDIA GPUDirect Storage (GDS) Compatible (Direct NVMe-to-VRAM bypass via MCIO)
System RAS & Security	Hardware/Software Secure Boot, Stores VPD

Solution Bundle Contents

The RocketStor 8631DH is shipped in a single, comprehensive retail package *(Accelerator and host server sold separately)*:

- 1x Rocket 7638D Hybrid PCIe Gen5 x16 Host Interface Card (Pre-installed Full-Height bracket; Low-Profile bracket included)
- 1x RocketStor 8631D PCIe Gen5 Accelerator Enclosure (Integrated 1300W CRPS PSU & Astera Labs Retimer backplane)
- 1x Certified 1m PCI-SIG® CopprLink™ CDFP (SFF-TA-1032) Cabled Interconnect (64 GB/s)
- 1x 12VHPWR / 12V-2x6 to Dual 8-Pin Power Harness
- 1x AC Power Cord & Quick Installation Guide (QIG)



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CopprLink PCIe 5.0 Switch PCIe GEN5 RETIMER

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