PAE Solution Bundles

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

PCIe Clearance | PCIe Bandwidth | Power | Cooling | Acoustics



RocketStor 8631DD

Scalable Dual-GPU Compute Expansion Solution

GPU-to-GPU 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 HighPoint RocketStor 8631DD is a PCIe Accelerator Expansion (PAE) solution bundle engineered to deploy multi-slot workstation GPUs—such as the NVIDIA® RTX™ PRO 6000 Blackwell—from standard 1U and 2U enterprise servers with scalable dual-accelerator physical capacity and unshared switch-level interconnects without sacrificing adjacent riser slots.

Feature Highlights

- Provides a dedicated PCIe Gen5 x16 compute pipeline.
- Supports up to 2 full-length, triple-slot accelerators up to 370 mm (L) x 170 mm (H) x 88 mm (W) *(second RS8631D required)*
- Designed to address the power, acoustic, thermal and 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 and Thermal load outside of the server chassis with independent 1300W CRSP PSU & acoustically-tuned dual-fan cooling system.

The single-width Rocket 1638E host card installs cleanly into a single PCIe slot (Full-Height Half-Length, compatible with standard 1U horizontal butterfly risers and 2U+ server risers), provisioning two independent external 64 GB/s CopprLink ports. By establishing native PCIe Gen5 Peer-to-Peer (P2P) DMA crossbar switching across its dual downstream ports, the onboard Broadcom 48-lane switch fabric delivers dual dedicated Gen5 x16 hardware links.

Overcome Mechanical, Electrical, Acoustic & Bandwidth Barriers Without Replacing Your Server



1 | Physical Clearance in 1U/2U Racks - Standard 1U and 2U servers typically utilize single-slot spacing. Two multi-slot workstation GPUs cannot physically fit inside 1U chassis, and may block as many as 6 adjacent slots in a 2U chassis—eliminating room for additional PCIe devices.

The RocketStor 8631DD solution: The Rocket 1638E only requires a single PCIe slot - it's dual PCIe Gen5 x16 CopprLink ports can each support a RocketStor 8631D enclosure, enabling the GPU's to be moved outside of the host chassis.



2 | Host Server Power Delivery Constraints - Deploying two NVIDIA BWE GPUs adds up to 1,200W to host's PSU and auxiliary GPU power connections. Under demanding workloads, this additional load can exceed available power thresholds, potentially causing power throttling, instability, or Over-Current Protection (OCP) shutdowns.

The RocketStor 8631DD solution: Add GPU capability without overtaxing on the host PSU. Each enclosure's dedicated 1300W CRPS PSU supplies power the GPU independently of the host.



3 | Host Server Thermal & Acoustic Burden – The need to dissipate up to 1,200W of additional waste heat can lead to severe thermal management challenges. Confined internal spaces and restricted airflow may forces system cooling fans to ramp up aggressively, generating intrusive acoustic noise that disrupts office-adjacent edge environments.

The RocketStor 8631DD Solution: The dedicated acoustically-tuned cooling system relocates the GPU thermal outside the host chassis at a controlled 65.9 dBA under full load.





PCIe 5.0 Switch

4 | Single-Slot PCIe Bifurcation & GPU P2P Bottleneck - Deploying two external GPUs from a single Gen5 x16 slot via passive bifurcation requires an x8/x8 lane configuration, which limits each GPU to 32 GB/s of theoretical bandwidth per direction—half that of a dedicated Gen5 x16 connection. Unlike an active PCIe switch, passive bifurcation provides no local inter-GPU switching fabric, leaving direct GPU-to-GPU P2P communication dependent on the host root-complex topology and platform support, potentially increasing latency and host-side data movement.

The RocketStor 8631DD solution: Dedicated PCIe Gen5 Switch technology combined with an external CopprLink interface provides a dedicated x16 lanes of Gen5 bandwidth (up to 64GB/s) for each GPU, requiring zero host-side bifurcation.

RocketStor 8631DD Solution Architecture

STANDARD 1U/2U HOST SERVER

Host PCIe Slot
PCIe Gen5 x16

Rocket 1638E
Dual-Port CopprLink PCIe Gen5 x16 Switch Adapter

RocketStor 8631D Enclosure

Astera Labs PCIe 5.0 Active Retimer
(SRIS Clocking)

Dedicated PCIe Gen5 x16 Pipeline

Workstation Class Accelerator
(Up to 360 mm L x 170 mm H x 88 mm Multi-Slot Width)

Isolated 1300W CRPS Industrial PSU
(0W Host Server Draw)

Acousticlly Tuned PSU + Dual Cooling Fans
(Controlled 65.9 dBA under Full Load)

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Application Deployment Ideas

CAE / CFD Simulation & Finite Element Solvers



Accelerating high-cell aeromechanical, thermal, and fluid dynamics simulations (OpenFOAM, Ansys Fluent) through direct low-latency Peer-to-Peer memory exchanges between GPUs.

Distributed Multi-GPU AI Scaling



Scaling distributed multi-agent LLM inference and localized fine-tuning workloads with hardware-level P2P DMA, delivering dedicated Gen5 x16 bus bandwidth to maximize NCCL All-Reduce efficiency across dual external accelerators.

Large-Mesh Finite Element Analysis



Processing complex structural mechanics, seismic wave propagations, and large-mesh physics simulations across multiple high-performance GPUs without CPU bus contention.

Specification	RocketStor 8631DD: PAE Dual-Port Scalable Compute Bundle
Packaging & Retail Model	**RocketStor 8631DD (Single Retail Box)**
Hardware Core Topology	1:2 Dual-GPU P2P Switch Fabric
Included Host Interface Card	1x Rocket 1638E 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	FHHL (148 mm x 110 mm); Single-width
Included Brackets	Full-Height Bracket
External Interconnect Ports	2x External CDFP Ports (2x Dedicated PCIe 5.0 x16)
CopprLink Compliance	PCI-SIG CopprLink compliant (CDFP Pinout / SFF-TA-1032)
Included Enclosures	1x RocketStor 8631D Enclosure *(Supports optional 2nd RS8631D enclosure)*
Signal Retiming Technology	Astera Labs PCIe 5.0 Active Retimers (1 per enclosure)
GPU / Accelerator Slots	1x PCIe 5.0 x16 Slot *(1 per enclosure; GPUs not included)*
Supported Accelerator Clearance	Up to 370 mm (L) x 170 mm (H) x 88 mm (W) per enclosure (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 (Scales to 2600W with 2nd enclosure)
Sustained GPU Power Capability	600W+ sustained draw (Scales to 1200W+ sustained with 2nd enclosure)
Included GPU Power Cables	1x 12VHPWR to Dual 8-Pin (2x4) Power Cables
Host Power Isolation	100% Externalized GPU Power
Acoustic Noise Profile	65.9 dBA per enclosure 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	CUDA P2P DMA Compatible (Switch-level inter-GPU routing; bypasses host CPU/RAM)
System RAS & Security	Hardware/Software Secure Boot, Stores VPD

Solution Bundle Contents

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

- 1x Rocket 1638E Dual-Port 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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