

# Adaptec® SmartRAID 4300 Series

NVMe® RAID Storage Accelerator

Media: PCIe® Gen 4/5 NVMe

## Enterprise RAID and Security With Accelerated NVMe® Performance

With the introduction of the new Adaptec® SmartRAID 4300 accelerator family, we deliver a fully featured and secure RAID-enabled, high-performance Software-Defined Storage (SDS) solution for NVMe deployments in server OEM, storage systems, data center and enterprise customers.

Leveraging Microchip's PCIe® storage controller as the underlying hardware to provide a supporting role for CPU offload and RAID acceleration the SmartRAID 4300 series separates the storage software stack to utilize the host PCIe infrastructure for more optimized data flows and connectivity. This new accelerator architecture overcomes bottlenecks inherent to traditional in-line storage solutions and enables the SmartRAID 4300 to deliver precise functionality and value when needed.

The SmartRAID 4300 maintains the enterprise-class features, functionality and hardware offload of our previous-generation in-line products, while delivering accelerated high performance that scales with the host, interconnect and CPU-attached NVMe endpoints. Management of the CPU-attached NVMe endpoints removes the dependencies that drive form factors, connector types and backplanes can create.

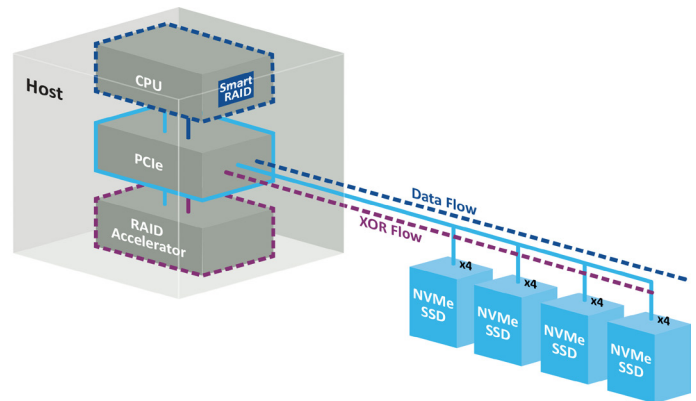
Our Trusted Platform support delivers a new level of compute and supply chain security based on a hardware root of trust that is aligned with the Open Compute Security Project.

## Accelerated Enterprise NVMe RAID Storage

Our SmartRAID 4300 disaggregates our Smart Storage platform into separate software and hardware components for a new software-defined storage approach for NVMe RAID. With Smart Storage software operating on the host CPU, I/O data flows maximize performance with writes occurring directly to the NVMe endpoints, while parity-based redundancy (XOR) is offloaded to the SmartRAID accelerator hardware.

## Maximum Performance

With a software-defined approach to NVMe RAID storage, the performance boundaries shift back to the individual components such as CPU, interconnect and endpoints. Managing these components with an expanded infrastructure, the Smart Storage software is able to deliver a maximum-performance, robust enterprise-class RAID solution, while enabling the SmartRAID accelerator hardware to complement and accelerate the overall performance capabilities, as opposed to potentially becoming a bottleneck.



| Workload                     | Windows |       | Linux |       | Units  |
|------------------------------|---------|-------|-------|-------|--------|
| Optimal                      | RAID0   | RAID5 | RAID0 | RAID5 |        |
| 4 KB Random Read             | 5       | 5     | 27.2  | 27.3  | M IOPS |
| 4 KB Random Write            | 4.8     | 2.3   | 22.4  | 5.1   | M IOPS |
| 128 KB/1 MB                  |         |       |       |       |        |
| Sequential Read              | 317     | 291   | 300   | 291   | GBps   |
| 128 KB/1 MB                  |         |       |       |       |        |
| Sequential Write             | 120     | 26    | 196   | 155   | GBps   |
| Rebuild                      | RAID0   | RAID5 | RAID0 | RAID5 |        |
| 4 KB Random Read             | NA      | 2.5   | NA    | 5.6   | M IOPS |
| 4 KB Random Write            | NA      | 1.1   | NA    | 2     | M IOPS |
| 128 KB/1 MB Sequential Read  | NA      | 55.6  | NA    | 32    | GBps   |
| 128 KB/1 MB Sequential Write | NA      | 8.9   | NA    | 22.6  | GBps   |

Note: Optimal performance is the best performance seen across multiple Gen 5 configs. Most results come from 32-drive configurations.

## Security and Ease of Use

Our industry-leading Smart Storage stack delivers enterprise reliability and maximum performance at all RAID levels and security features like hardware root of trust, secure boot/update and attestation. Self-Encrypting Drive (SED) support provides additional security by encrypting data at rest.

The Adaptec SmartRAID 4300 accelerator is conveniently managed by the Adaptec maxView™ tool that includes ARCCONF CLI, maxView HTML5-based web GUI and plugins for remote and local management of enterprise and data center storage management software suites using standard desktops and mobile browsers for in-band network management. Distributed Management Task Force (DMTF) standards-based management, Platform-Level Data Model (PLDM) and Redfish® Device Enablement (RDE) via MCTP protocol support for out-of-band Baseboard Management Controller (BMC) management.

## Benefits

- Maximum performance
  - Manage up to 32 CPU-attached NVMe SSD endpoints, each with up to x4 bandwidth on supporting platforms
- Eliminates PCIe bandwidth bottleneck
  - NVMe SSD endpoints connected directly to host CPU and not bound by single x16 host interface
- Hardware offload
  - RAID activity is offloaded from host CPU
- Scalable
  - Scales with host CPU, NVMe endpoints and interconnect (CPU-attached, fabric-attached)
- Future-proof for next-generation platforms
  - Deployable across multiple generations of PCIe, providing increased versatility and lifespan
- Excellent for enabling NVMe storage capabilities for SMB, enterprise and hyperscale applications, with proven reliability

## Highlights

- Low profile, MD2 form factor
- 16-lane (x16 “Ultra”) PCIe accelerator adapter
- Secure boot, secure update and attestation
- Support for 32 NVMe devices and up to 64 LD/RAID arrays
- RAID 0, 1, 10, 5, 50, 6, 60
- RAID online capacity expansion
- Pre-boot UEFI management
- maxView tool support
- SED management software

## Ordering Information

| Product Name              | Part Number | RAID Levels            | Host Interface      | NVMe Device Support | Form Factor        |
|---------------------------|-------------|------------------------|---------------------|---------------------|--------------------|
| SmartRAID Ultra 4308P-32a | 4308UP32AXS | 0, 1, 5, 10, 50, 6, 60 | 16-lane PCIe® Gen 4 | 32                  | Low Profile (HHHL) |

|                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Key Software Features              | <ul style="list-style-type: none"><li>• Support for up to 32 CPU-attached NVMe devices with NVMe Gen 4/5 interfaces</li><li>• Support for 64 logical drives/RAID arrays</li><li>• Support for native 4K sector and 512 byte NVMe devices</li><li>• Online capacity expansion</li><li>• Background initialization</li><li>• Hot-plug drive support</li><li>• Hot spares—global, dedicated and pooled, including copyback</li></ul> | <ul style="list-style-type: none"><li>• MCTP and Platform Level Data Model (PLDM) and Redfish® Device Enablement (RDE) for out-of-band (BMC) management</li><li>• Configurable stripe size</li><li>• S.M.A.R.T. support</li><li>• Dynamic sector repair</li><li>• Bootable array support through UEFI BIOS</li><li>• SmartXLR driver with multiple queue and MSI-X support for all applicable operating system device drivers</li></ul> | <ul style="list-style-type: none"><li>• Secure boot, secure update and attestation support</li><li>• Secure boot support for the UEFI host BIOS</li><li>• Self-Encrypting Drive (SED) support with local and remote key management</li><li>• USB image with offline maxView tools at <a href="http://www.adaptec.com/en-us/support/start">www.adaptec.com/en-us/support/ start</a></li></ul> |
| Management Utilities               | <b>maxView™ Storage Manager</b> <ul style="list-style-type: none"><li>• Web-based GUI management utility</li><li>• Windows® and Linux® support</li><li>• Remote configuration, monitoring and notification</li><li>• Remote firmware updates</li><li>• SMI-S support</li><li>• SMTP</li></ul>                                                                                                                                     | <b>ARCCONF</b> <ul style="list-style-type: none"><li>• Command-line interface</li><li>• Local and remote support</li><li>• ARCCONF support for UEFI shell</li></ul>                                                                                                                                                                                                                                                                     | <b>UEFI BIOS Configuration Utility</b> <ul style="list-style-type: none"><li>• HII-based configuration utility</li><li>• Flashable BIOS support</li><li>• Event monitor<ul style="list-style-type: none"><li>• Lightweight event monitoring and logging tool</li><li>• Distributes adapter events and notifies user</li></ul></li></ul>                                                      |
| Operating Systems                  | Microsoft® Windows Server, Windows 11, Red Hat® Enterprise Linux, SuSE Linux Enterprise Server, Ubuntu Linux, Debian Linux, Oracle Linux (available from <a href="http://www.adaptec.com/en-us/support/start">www.adaptec.com/en-us/support/start</a> )                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
| Management Utilities (Out-of-Band) | MCTP and PLDM/RDE                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
| Dimensions                         | 2.713 inch × 6.6 inch (68.9 mm × 167.65 mm)                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
| Airflow (0°C to 55°C)              | 300 LFM airflow                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
| MTBF                               | 3.0 million hours measured at 40°C                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
| Current and Power Requirements     | Power (Typical)                                                                                                                                                                                                                                                                                                                                                                                                                   | 12V Current (Typical)                                                                                                                                                                                                                                                                                                                                                                                                                   | 3.3V Current (Typical)                                                                                                                                                                                                                                                                                                                                                                       |
|                                    | 20.75 W                                                                                                                                                                                                                                                                                                                                                                                                                           | 1.72 A                                                                                                                                                                                                                                                                                                                                                                                                                                  | 57 mA                                                                                                                                                                                                                                                                                                                                                                                        |
| Regulatory Certification           | CE, FCC, UL, C-Tick, VCCI, KCC, CNS                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |
| Environmental Compliance           | RoHS                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                              |

\*All features may not be available with initial product release. Please contact Microchip for more information.