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MaxLinear and Los Alamos National Laboratory Jointly Advance High-Performance File System Acceleration for HPC Storage

- *Pioneering Hardware-Accelerated ZFS to Improve Throughput, Efficiency, and Scalability in HPC Storage*

CARLSBAD, Calif. & LOS ALAMOS, N.M.--(BUSINESS WIRE)-- **MaxLinear, Inc.** (NASDAQ: MXL), a leading provider of high-performance storage accelerator SoCs, and **Los Alamos National Laboratory (LANL)** today announced a collaboration to enable **hardware-accelerated OpenZFS File System** storage for large scale, high-performance computing (HPC) environments.

This press release features multimedia. View the full release here: <https://www.businesswire.com/news/home/20260603338003/en/>

MaxLinear and Los Alamos National Laboratory collaborate on hardware-accelerated OpenZFS storage using Panther™ Storage Accelerator SoCs for HPC environments.

Los Alamos National Laboratory and MaxLinear have jointly developed a

hardware-accelerated OpenZFS storage architecture designed to improve performance and storage capacity for next-generation NVMe flash-based storage infrastructure.

“Los Alamos’ Direct I/O support and Z.I.A. (ZFS Interface for Accelerators) work were developed to accelerate performance for the ZFS-using community,” said Gary Grider, Senior Director for Computing Technologies at the Laboratory. “In this collaboration, MaxLinear demonstrated hardware-offloaded ZFS operations with reported speedups of approximately 39x for writes and 7x for reads. These results illustrate the potential for accelerator-based approaches to reduce host CPU involvement while maintaining the data-protection benefits associated with ZFS.”

“Los Alamos National Laboratory has been at the forefront of advancing storage architectures for high-performance computing,” said Vikas Choudhary, Executive Vice President of Connectivity & Storage at MaxLinear. “By enabling hardware-accelerated ZFS with Panther™ Storage Accelerators, we deliver deep data compression, data protection services, and multi-hundred gigabit scalability—while preserving the data integrity guarantees that ZFS is known for.”

LANL has decades of experience in operating ZFS at scale and has led to the development

of key filesystem extensions, including **Direct I/O** support and ZIA (**ZFS Interface for Accelerators**)—a structured framework for introducing hardware acceleration into the ZFS data path without modifying core filesystem semantics.

MaxLinear contributes the **Panther™ family of Storage Accelerator SoCs and Storage Software Development Kits**, providing high throughput, low latency execution of ZFS data path services using a domain-specific high-performance SoC architecture. Panther™ provides **deep data compression, encryption, deduplication, and data protection services** executed inline in hardware, delivering high throughput and low latency while significantly reducing host CPU overhead.

Through this collaboration, Panther is integrated with ZFS as a Data Processing Unit Services Module (DPUSM) provider, enabling inline hardware acceleration of selected CPU-intensive operations such as data compression and checksum generation to increase storage capacity, improve file I/O performance, and reduce host CPU utilization. This combined hardware-software approach preserves ZFS ordering, consistency, and data integrity guarantees while enabling efficient compute offload and scalable acceleration.

This collaboration integrates LANL's advancement in Direct I/O and ZIA framework with MaxLinear's Panther™ Storage Accelerator.

Key capabilities include:

- **Hardware-assisted ZFS services enabling deep data compression:** Offload compression reduces host CPU involvement on high throughput I/O paths, enabling high I/O performance with minimal impact on CPU utilization.
- **Scalable accelerator integration:** Multiple Panther™ Storage Accelerators can be deployed in parallel through ZIA, enabling scalable performance without introducing serialization or centralized bottlenecks.
- **High bandwidth operation:** Achieved for the first time **57 GB/s read**, and **47 GB/s write** with GZIP L9 at ~1.3:1 compression, representative of high-entropy scientific data. Achieving this compression requires compute intensive algorithms like GZIP. Without Panther™, ZFS is limited to ~1.2 GB/s writes and 8.1 GB/s reads—delivering ~39x write and **~7x read speedup** via hardware offload. Scales further with additional accelerators.

For more information on MaxLinear's Panther™ Storage Accelerator, visit <https://www.maxlinear.com/panther>

About MaxLinear, Inc.

MaxLinear, Inc. (Nasdaq: MXL) is a leading provider of radio frequency (RF), analog, digital, and mixed-signal integrated circuits for access and connectivity, wired and wireless infrastructure, and industrial and multimarket applications. MaxLinear is headquartered in Carlsbad, California. For more information, please visit <https://www.maxlinear.com/>.

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About Los Alamos National Laboratory

Los Alamos National Laboratory is a federally funded research and development center with priorities set by the Department of Energy's National Nuclear Security Administration (DOE NNSA) and key national strategy guidance. We execute work across all of DOE's missions: national security, science, energy, and environmental management. Scientific and engineering capabilities developed through LANL's stockpile research are part of what makes DOE and NNSA a science, technology, and engineering powerhouse for the nation.

Cautionary Note About Forward-Looking Statements

This press release contains forward-looking statements within the meaning of Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. Forward-looking statements include, among others, statements relating to MaxLinear's products and technology and the functionality, performance and benefits of such products and technology, including the capabilities of the OpenZFS storage architecture and MaxLinear's Panther™ family products; statements regarding the potential benefits of the collaboration between MaxLinear and LANL; and statements by MaxLinear's Executive Vice President of Connectivity & Storage and LANL's Senior Director for Computing Technologies. These forward-looking statements involve known and unknown risks, uncertainties, and other factors that may cause actual results to be materially different from any future results expressed or implied by the forward-looking statements and our future financial performance and operating results forecasts generally. Forward-looking statements are based on management's current, preliminary expectations and are subject to various risks and uncertainties. In particular, our future operating results are substantially dependent on our assumptions about market trends and conditions. Additional risks and uncertainties affecting our business, future operating results and financial condition include, without limitation; risks relating to: the development, testing, and commercial introduction of new products and product functionalities and the capabilities of MaxLinear's technology, including the OpenZFS storage architecture and MaxLinear's Panther™ family products; risks related to the collaboration between MaxLinear and LANL; our terminated merger with Silicon Motion and related arbitration and class action complaint and the risks related to potential payment of damages; the effect of intense and increasing competition; increased tariffs, export controls or imposition of additional trade barriers; impacts of global economic conditions; the cyclical nature of the semiconductor industry; a significant variance in our operating results and impact on volatility in our stock price, and our ability to sustain our current level of revenue, which has previously declined, and/or manage future growth effectively, and the impact of excess inventory in the channel on our customers' expected demand for certain of our products and on our revenue; escalating trade wars, military conflicts and other geopolitical and economic tensions among the countries in which we conduct business; international geopolitical and military conflicts; our ability to obtain or retain government authorization to export certain of our products or technology; the loss of, or a significant reduction in orders from major customers; legal proceedings or potential violations of regulations; information technology failures; a decrease in the average selling prices of our products; failure to penetrate new applications and markets; development delays and consolidation trends in our industry; inability to make substantial and productive

research and development investments; delays or expenses caused by undetected defects or bugs in our products; substantial quarterly and annual fluctuations in our revenue and operating results; failure to timely develop and introduce new or enhanced products; order and shipment uncertainties and differences between our estimates of customer demand and product mix and our actual results; failure to accurately predict our future revenue and appropriately budget expenses; lengthy and expensive customer qualification processes; customer product plan cancellations; failure to maintain compliance with government regulations; failure to attract and retain qualified personnel; any adverse impact of rising interest rates on us, our customers, and our distributors and related demand; risks related to compliance with privacy, data protection and cybersecurity laws and regulations; risks related to conforming our products to industry standards; risks related to business acquisitions and investments; claims of intellectual property infringement; our ability to protect our intellectual property; security vulnerabilities of our products; use of open source software in our products; failure to manage our relationships with, or negative impacts from, third parties; and future decisions relating to our stock repurchase program.

In addition to these risks and uncertainties, investors should review the risks and uncertainties contained in our filings with the Securities and Exchange Commission, including our Current Reports on Form 8-K, as well as the information to be set forth under the caption "Risk Factors" in MaxLinear's Quarterly Report on Form 10-Q for the quarter ended March 31, 2026. All forward-looking statements are based on the estimates, projections and assumptions of management as of the date of this press release, and MaxLinear is under no obligation (and expressly disclaims any such obligation) to update or revise any forward-looking statements whether as a result of new information, future events, or otherwise.

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