
Leil Introduces Leil OS™: The Industry's First HDD-Native Storage Operating System Purpose-Built for the SMR Era

New software product delivers 95%+ efficiency on CMR (conventional magnetic recording) and SMR (shingled magnetic recording) drives, bringing hyperscale-grade storage economics to enterprise and service provider deployments.

Tallinn, Estonia — April 1st, 2026 — Leil, an Estonian software company developing HDD-Native™ software-define storage for large-scale, on-premise infrastructure, today announced Leil OS™, a storage operating system built from the ground up for Shingled Magnetic Recording (SMR) drives. Leil OS™ marks a strategic shift from hardware-agnostic storage software toward a purpose-built, HDD-Native™ architecture designed to close the efficiency gap between hyperscaler storage operations and the broader enterprise market. As the only software stack purpose-built to fully support the industry's most widely deployed, high-capacity, and cost-efficient HDDs, Leil OS™ establishes a new standard for HDD-Native™ storage.

Addressing a Structural Gap in the Storage Industry

The storage industry is undergoing a fundamental transformation. AI workloads, data lakes, and hyperscale cloud operations are driving demand for high-capacity storage at rates that exceed the capabilities of traditional architectures. While SMR drives now represent over half of high-capacity HDD production, most software stacks remain optimized for legacy recording technologies. 'Additionally, the shift toward capacity-centric metrics—measuring exabytes shipped rather than units sold—reflects a new industry reality,' said David Gerstein, CTO and Co-Founder of Leil. 'Storage value is now defined by how efficiently data can be stored while preserving top performance possible, not by the number of drives deployed,' added Aleksander Ragel, CEO and Co-Founder of Leil.

Proven at Scale: Unlocking the Value

The storage industry has also reached a turning point, where visionary concepts are giving way to concrete, productized solutions. With the official launch of Leil OS™, the company introduces a mature, validated product for high-capacity storage—market-ready and supported through proven partnerships with all HDD vendors. Built to maximize ROI, Leil OS™ delivers higher performance, lower latency, and reduced power consumption from existing commodity hardware. Its HDD-Native™ design, which understands drives at the physical level rather than through legacy abstractions, gives operators unprecedented control and efficiency, with every feature focused on simplifying storage operations and driving efficiency.

Today, SMR drives have become a hard-drive standard for hyperscale and enterprise workloads, and Leil OS™ enables operators to harness them at near-raw hardware maximum speeds—unlocking up to 20% more capacity with no trade-offs.

Leil OS™: HDD-Native™ by Design

Leil OS™ is designed for deep alignment with the physical characteristics of modern HDDs, enabling this HDD-Native™ software stack to maximize available capacity and optimize I/O performance. By enabling full SMR support, Leil OS™ extends hyperscale efficiency to on-premise environments—unlocking the most efficient and widely used capacity drives for broader adoption. This approach is built on four pillars, each directly tied to measurable operator outcomes:

Extra Capacity

By fully supporting SMRs, Leil OS™ unlocks approximately 20% additional usable capacity per drive—the equivalent of +6TB free on a single high-capacity disk today—without additional hardware cost. This capacity bonus is inherent to SMR's shingled recording physics but requires purpose-built software to realise. Legacy stacks leave it stranded.

Extra Performance

Leil OS™ achieves 99% of theoretical maximum read throughput and approximately 95% write efficiency, verified in testing with two major HDD vendors. Sequential I/O alignment and separated data and metadata paths eliminate the fragmentation penalties of legacy architectures, closing the practical performance gap between SMR and CMR drives.

Extra Longevity

Hardware-aware management transforms drives from depreciating liabilities into long-term assets. By reducing unnecessary write amplification, managing wear levelling at the OS layer, and tolerating partial component degradation, Leil OS™ extends effective drive lifespan by up to 40% — reducing warranty failure rates and lowering total cost of ownership at petabytes scale.

Sustainability

Leil's proprietary Infinite Cold Engine (ICE) technology leverages the SATA/SAS Power Pin3 standard to physically disconnect electricity from idle HDDs—true zero-watt standby at a drive level. ICE manages power transitions at the filesystem layer, reducing electricity OPEX by up to 70% while keeping up to 90% of drives in a powered down state with a fast wake-up as necessary. ICE also reduces thermal stress and extends drive longevity—critical for AI long-term data retention and drives extended lifespan.

Expanding the Open Source Ecosystem with Leil FS™

Alongside the Leil OS™ announcement, the company is broadening the availability of Leil FS™, its open-source filesystem (successor to Sauna FS). Leil FS™ will be integrated into multiple major Linux distributions, allowing installation via standard package repositories. This strategy lowers the barrier to SMR adoption and establishes Leil FS™ as community-driven infrastructure for the HDD-Native™ ecosystem. First distributions to receive Leil FS™ are Debian and Ubuntu, with Fedora coming next and own packages available for other distributions.

Both the open-source Leil FS™ and the commercial Leil OS™ are now unified under a single brand, with innovations flowing between the two to ensure consistency and accelerate development.

Availability and Roadmap

Leil OS™ is available for qualified, mission critical deployments. The product roadmap includes continued development of HDD-Native™ features contingent on industry adoption of SAS4+ enclosures and PCIe upgrades, with full next-generation hardware support expected within 12 to 18 months. Leil FS™ packages for major Linux distributions are in active development, with initial availability targeted for mid-2026.

Unified Brand, Unified Vision

The Leil OS™ launch coincides with a consolidation of the company's product portfolio under a single, authoritative brand. The company's core SMR intellectual property is powered by the SMRT engine, a purpose-built technology layer that underpins Leil OS™. The open-source edition (Leil FS™) and the commercial offering (Leil OS™) now share a unified identity, simplifying the path from community adoption to enterprise deployment.

About Leil

Leil is an Estonian data storage company developing HDD-Native™ software for large-scale, on-premises infrastructure. Its system delivers energy-efficient, cost-effective, and scalable storage with hyperscale-grade efficiency. Available in commercial (Leil OS™) and open-source (Leil FS™) editions, Leil enables data-intensive organizations to manage rapidly growing data volumes without added complexity. Founded in 2022 by storage experts, Leil aims to make hyperscale storage economics accessible to the enterprise market.

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