Top 5 Reasons

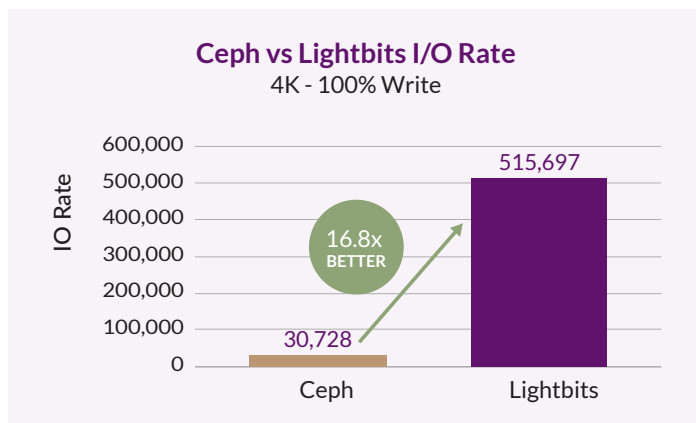## Why Lightbits Outperforms Ceph for Private Clouds

Organizations from a wide range of industries are building their own on-premises, private clouds with modern, software-defined storage emerging as the preferred architecture for its ability to meet their scalability, performance, and cost-efficiency needs.

Open-source Ceph is frequently considered for its software-defined block storage capabilities. But where higher performance is required or when the environment scales, Ceph often shows significant limitations. **That's where Lightbits comes in.**

FIVE WAYS LIGHTBITS BLOCK STORAGE IS BETTER THAN CEPH FOR PRIVATE CLOUDS

1. HIGH PERFORMANCE THAT SCALES

Lightbits demonstrates 16x better IOPS and significantly higher throughput than Ceph across various workloads, scaling beyond the petabyte level and delivering up to 75 million IOPS and consistent sub-millisecond latency even under a heavy load. This exceptional performance profile ensures optimal responsiveness for cloud-native applications, enhancing overall user experience and productivity. Built by the inventors of the NVMe® over TCP (NVMe/TCP) protocol, Lightbits delivers exceptional performance using standard TCP/IP networks and Ethernet NICs without requiring any configuration changes. No proprietary software is installed on client systems.

Ceph vs Lightbits I/O Rate
4K - 100% Write

IO Rate

- 600,000
- 500,000 — Lightbits: 515,697
- 400,000
- 300,000 — 16.8x BETTER
- 200,000
- 100,000
- 0 — Ceph: 30,728

Ceph   Lightbits

2. COST EFFICIENT AND LOWER TCO

Leveraging Lightbits' disaggregated architecture, enterprises can achieve higher performance with fewer resources scaling their storage infrastructure seamlessly as their needs evolve. By requiring fewer servers and storage media compared to Ceph, Lightbits significantly reduces infrastructure costs, maximizing return on investment while maintaining top-tier performance. Where application servers with local NVMe are often 15-25% utilized, Lightbits allows you to scale performance and capacity independently and dynamically to maximize utilization.

3. HIGHLY AVAILABLE FOR ENHANCED RESILIENCY

Lightbits' clustered architecture eliminates service disruptions if nodes or drives fail or become inaccessible, heals itself when nodes or drives are replaced, and supports non-disruptive rolling software upgrades. Intelligent flash management and erasure coding techniques provide robust data protection and high availability. Unlike Ceph's replication approach, Lightbits' erasure coding ensures data availability even in the event of multiple drive failures, minimizing downtime and ensuring uninterrupted operations. Multi-zone synchronous replication across racks or data centers provides resiliency for business continuity.

4. SEAMLESSLY INTEGRATED WITH CLOUD-NATIVE ENVIRONMENTS

Designed from the ground up for cloud environments, Lightbits seamlessly integrates with Kubernetes and other cloud-based applications. Its compatibility with NVMe/TCP and Kubernetes Container Storage Interface ensures easy deployment and management within modern cloud infrastructures, simplifying operations and accelerating time to market. A single Lightbits cluster can support hundreds of Kubernetes clusters.

5. ESSENTIAL DATA SERVICES THAT REDUCE RISK

For mixed workloads and multiple heterogeneous environments, Lightbits enables multi-tenancy with Quality-of-Service capabilities to prevent "noisy neighbor" resource hogging. Data protection and persistent volumes are delivered via space-efficient snapshots and clones with near-instant restores. Enable DevOps to innovate at the speed of NVMe by cloning multi-terabyte databases nearly instantaneously. Developers are able to apply, test, and validate changes using minimal storage capacity and without disrupting production systems. All these data services are available at no additional cost.

Further your learning with the white paper, "Run Apps up to 16X Faster: Storage Performance Comparison Lightbits vs. Ceph Storage."

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