PRODUCT BRIEF

Intel® Enterprise Edition
for Lustre* software

Intel® Enterprise Edition for Lustre* Software

Performance at scale, plus enterprise-level features

Lustre powers 70% of the world's top 100 fastest computers.[1]

The Lustre* file system is the ideal distributed, parallel file system for high performance computing (HPC). With Intel® Enterprise Edition for Lustre* software, Intel provides an enterprise-grade version of Lustre optimized to address the key storage and data throughput challenges of HPC-class environments.

Intel Enterprise Edition for Lustre software (Intel® EE for Lustre* software) unleashes the performance and scalability of the Lustre parallel file system for organizations large and small. Businesses that need large-scale, high-bandwidth storage can tap into the power and scalability of Lustre—along with the additional features, capabilities, and worldwide 24/7 technical support from the Lustre experts at Intel.

Intel® Manager for Lustre*, a purpose-built management system and key component of Intel EE for Lustre software simplifies the installation, configuration, and monitoring of the Lustre file system. It reduces management complexity, enabling storage administrators to easily take advantage of the performance and scalability of Lustre-based storage. The administrator dashboard tracks real-time monitoring, including tracking usage, performance metrics, events, and errors at the Lustre software layer.

The Intel EE for Lustre Advantage

Intel EE for Lustre software is ideal for data-intensive applications, providing high-performance file sharing to users while scaling as compute and storage resources grow. Open interfaces promote easy integration and interoperability with existing infrastructures. Data center storage systems can grow over time and on budget employing a variety of networking and hardware options.

Performance

Intel EE for Lustre software was designed to enable fully parallel I/O across clients, servers, and storage devices. Metadata and data are stored separately to allow optimization of each function for the different workloads they present.

- Massive data flows efficiently use a high percentage of the underlying storage and network bandwidth for low latency, high-throughput storage performance.
- Enterprises can run larger and more complex simulations faster and easier, facilitating their innovation.
- Native Lustre clients optimized for Intel® Xeon Phi™ coprocessors deliver data 10 times faster than a Network File System (NFS)—boosting application performance.[3]
- Improved metadata scalability using the Distributed Namespace (DNE) features integrated in Intel® Manager for Lustre.
- Lustre is POSIX compliant, can be mounted like NFS, and is able to use support for native file systems, vital for today's applications.

Figure 1.
Intel® Manager for Lustre* Dashboard

1,000,000,000,000 BYTES PER SECOND

Leading-edge Lustre* configurations can deliver data throughput in excess of 1 terabyte per second.[2]

WHAT'S NEW IN INTEL® EE FOR LUSTRE* SOFTWARE?

	Intel® Omni-Path Architecture (Intel® OPA) Support: Intel® EE for Lustre* software supports Intel OPA, as well as all major HPC fabrics, including InfiniBand*. Intel OPA fabric support is available for systems running RHEL* 7.2.
Lustre 2.7	**Lustre 2.7:** Brings the latest stability fixes and performance enhancements from extensive production deployments and a comprehensive test framework. Provides the latest Intel EE for Lustre software core.
	Single Client Metadata Concurrency: An update to metadata communications interface between client and server that allows multiple metadata RPCs to be in flight in parallel per client for both read and write transactions.
	Online Lustre* File System Checker (LFSCK): Allows checks and repairs to be performed without downtime. In this release, LFSCK will verify and repair the Object Index (OI) table, directory FID-in-dirent and LinkEA, MDT-OST file layout inconsistencies, and inconsistencies between multiple MDTs.
OpenZFS	**OpenZFS* Updates:** Several performance and stability improvements available after updating to the latest version (0.6.5). Improved I/O throughput for large files, now that the dataset record size can be set up to 1MB.
	Snapshots: A mechanism that is now capable of leveraging OpenZFS to take a coordinated snapshot of an entire file system (provided that all of the metadata and storage targets are formatted using OpenZFS). With this version the snapshot is taken across the whole file system, and can be mounted on a Lustre client as a separate name space.
	Secure Authentication and Encryption: Kerberos functionality is now applied to Intel EE for Lustre software to establish trust between Lustre servers and clients, and support encrypted network communications.
	Secure Clients: Includes SELinux* support to enforce access control policies including multilevel security (MLS) on Lustre clients.
	Dynamic Networking: Simplify system administration tasks with a powerful extension to the Lustre network (LNet). Tune and optimize LNet, while Lustre is still running on the target node, and add, remove, and update LNet routers without effecting Lustre network traffic.
	Intel® Manager for Lustre*: Some of the updates include support for latest RHEL releases, and UI refresh with new workflows and improvements to responsiveness, performance, layout, and navigation.

Conclusion

Lustre is capable of handling extremely large amounts of data and huge numbers of files shared concurrently across clustered servers. Storage powered by Lustre software is a breakthrough technology for addressing the exascale and emerging high-performance data analytics challenge. Now, with Intel EE for Lustre software, organizations have an enterprise-class solution to meet their storage and data requirements.

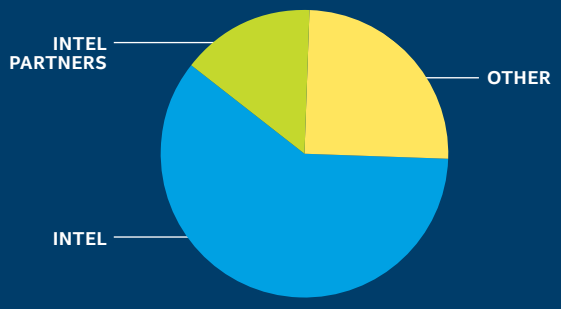
Questions?

Contact us: lustre.intel.com/contactus

For more information about the Intel® Solutions for Lustre* software portfolio, visit intel.com/lustre

A SUSTAINED COMMITMENT TO DRIVING LUSTRE* FORWARD

Backed and supported by OpenSFS and EOFS, Intel leads the open, collaborative feature development of the Lustre file system.



Intel is a long-standing and leading contributor to the Lustre* community.

1. Based on Intel analysis of November 2015 Top500: www.top500.org.
2. Source: OLCF's 1 TB/s, Next-Generation Lustre File System, Oak Ridge Leadership Computing Facility.
3. Configuration: Mellanox IB card in host and Lustre* configuration with the Intel® Xeon Phi™ coprocessor. Other optimization with hardware may provide additional benefits.

For more complete information about performance and benchmark results, visit intel.com/benchmarks.

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