PRODUCT BRIEF
Intel® Enterprise Edition for Lustre* Software
High Performance Data Division

Intel® Enterprise Edition for Lustre* Software

A New Generation of Lustre Software Expands High Performance Computing into the Commercial Enterprise

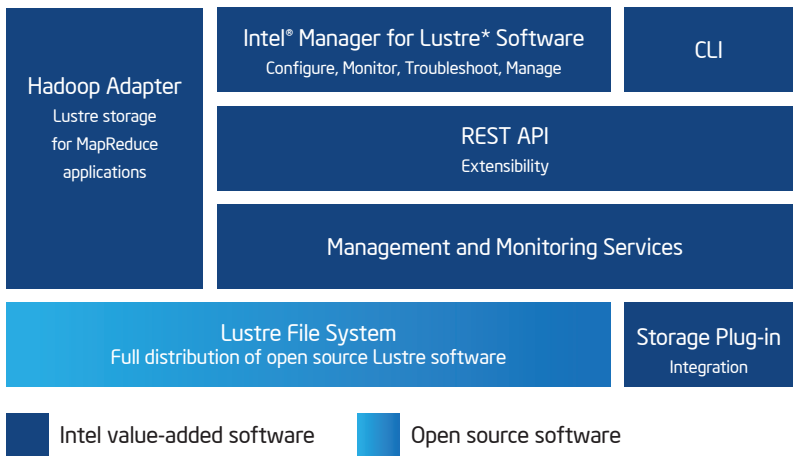
KEY FEATURES

- Built on open-source Lustre* software
- Centralized, GUI-based administration for management simplicity
- Enormous storage capacity
- Real-time system monitoring for maximum availability
- Open, documented interfaces for deep integration
- Rigorously tested, stable software proven across diverse industries
- I/O throughput in excess of 1 terabyte per second
- Global 24X7 technical support

Intel® Enterprise Edition for Lustre* software (Intel® EE for Lustre* software) unleashes the Lustre parallel file system as an enterprise platform for a broad spectrum of commercial organizations, both large and small. It allows businesses that need large scale, high-bandwidth storage to tap into the power and scalability of Lustre, but with the simplified installation, configuration and monitoring features of Intel® Manager for Lustre* software, a management solution purpose-built for the Lustre file system. Intel EE for Lustre software includes proven support from the Lustre experts at Intel, including worldwide 24x7 technical support.

High Performance Parallel Storage for the Enterprise

Intel EE for Lustre software brings the benefits of Lustre and high performance computing (HPC) to data-intensive businesses. For decision makers seeking to achieve their business goals more quickly and cost effectively, Intel EE for Lustre software offers a parallel file system that enables more powerful computing for improved results and data-driven business and IT intelligence. Intel EE for Lustre software provides open interfaces that promote easy integration and high levels of interoperability with existing infrastructures. Because Lustre is open source software, IT can grow data center storage systems over time and on budget, employing a variety of networking and hardware options.



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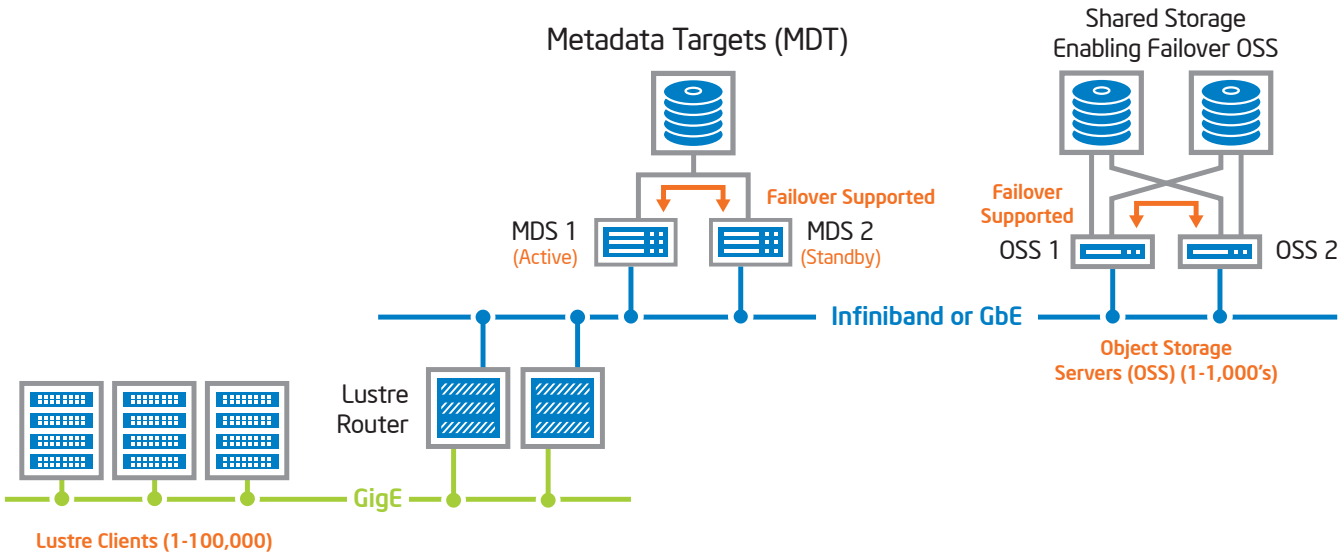


Figure 1. Typical Lustre configuration

INTEL AND OPEN SOURCE LUSTRE

Lustre has been developed in an open, collaborative community and is freely available in open-source software under the GPLv2 license. Intel is committed to maintaining Lustre as an open system while providing expert support and tools to enhance management. Intel takes pride in being a long-standing member of the open-source community, and believes in open source development as a means to create rich business opportunities, advance promising technologies, and bring together top talent from diverse fields to solve computing challenges. Intel's contributions to the open source community include reliable hardware architectures, professional development tools, work on essential open-source components, collaboration and co-engineering with leading companies, investment in academic research and commercial businesses, and helping to build a thriving ecosystem around open source.

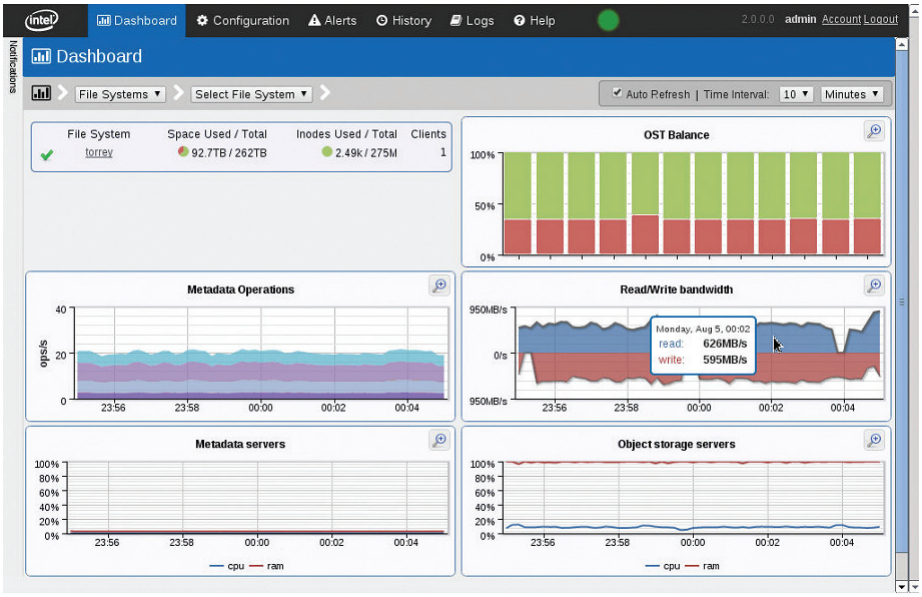
What is Lustre?

The Lustre file system was purpose-built to provide sustained performance and stability at large scale for storage in HPC clusters. Lustre is POSIX-compliant, and capable of handling extremely large amounts of data and huge numbers of files shared concurrently across clustered servers. It offers wide scalability, both in performance and storage capacity. According to top500.org, Lustre is the most widely used file system in supercomputing, powering over 60 percent of the TOP100 supercomputing sites worldwide[1]. Lustre has traditionally been employed in HPC environments that generate and process massive amounts of data for research, governmental, and industrial purposes, and is one of the best breakthrough technologies for addressing the exascale and emerging "big data" challenges of tomorrow.

However, HPC is no longer the exclusive province of such data-rich projects as genomics, climate change simulations, and mechanical modeling. Increasingly, organizations and businesses of all kinds generate high-volume data flows, and rely on scalable storage to deliver very high I/O rates and massive capacity to super-scale applications.

With the release of Intel Enterprise Edition for Lustre software, Intel provides enterprise customers with a commercial-grade version of Lustre optimized to address key storage and data throughput challenges of HPC-class computing in business.

Intel Enterprise Edition for Lustre software provides a parallel file system that delivers massive scalability in performance and storage capacity for commercial HPC.



Intel® Manager for Lustre* software consolidates Lustre information in a central, browser-accessible location for ease of management.

Performance

Intel EE for Lustre software is designed to enable fully parallel I/O throughput across thousands of clients, servers and storage devices. Metadata and data are stored on separate servers to allow optimization of each system for the different workloads they present. Intel EE for Lustre can also scale down efficiently to provide fast parallel storage for smaller organizations.

- Many Lustre configurations are running in production at 500 to 750 gigabytes per second, with leading edge installations achieving throughput in excess of 1 terabyte per second
- Delivers data faster to critical applications, leading to improved decision-making based on near real-time analysis
- Massive data flows can utilize a high percentage of underlying storage and network bandwidth, for low performance overhead
- Provides an innovative edge by allowing an enterprise to run larger and more complex simulations faster and easier

Capacity

The object-based storage architecture of Intel EE for Lustre software can scale to tens of thousands of clients and petabytes of data.

- At 512 petabytes of storage for the current version of Lustre, storage capacity is enormous
- Lustre was developed to handle the demands of scientific data, and has been tested and trusted at extreme levels of throughput, with no upper limits to its storage scale

Affordability

Intel EE for Lustre software is based on open source Lustre software, and is hardware, server, and network fabric neutral. Enterprises can scale their storage deployments horizontally, yet continue to have simple-to-manage storage.

- Intel EE for Lustre promotes multi-vendor solutions, so administrators can customize their storage infrastructure to accommodate their unique storage requirements and budgets
- Intel Manager for Lustre software adds tools and GUI for fast, efficient management; Intel EE for Lustre software does not require specialized training or expertise to operate

Maturity

Lustre has been in use in the world's largest datacenters for over a decade and hardened in the harshest big data environments; recent versions are highly trusted, reliable and well architected. Today's Lustre has been rigorously tested and proven for diverse markets and real-world use cases.

- Intel EE for Lustre delivers commercial-ready Lustre in a package that can scale efficiently both up and down to suit your business workloads, with built-in manageability.
- Intel EE for Lustre software has a clear product roadmap, with predictable releases
- Intel EE for Lustre software brings together the best and brightest of Lustre expertise coupled with the resources and credibility of Intel

Intel® Manager for Lustre*

Intel Manager for Lustre provides a unified, consistent view of Lustre storage systems and simplifies the installation, configuration, monitoring and overall management of Lustre. The manager consolidates all Lustre information in a central, browser-accessible location for ease of management and reduced complexity.

Key Features

Intuitive, browser-based administration

- Simple but powerful graphical and scriptable command line interfaces
- Point-and-click simplicity for cluster configuration and management
- Centralized definition and management of common administrative tasks

Real-time system monitoring

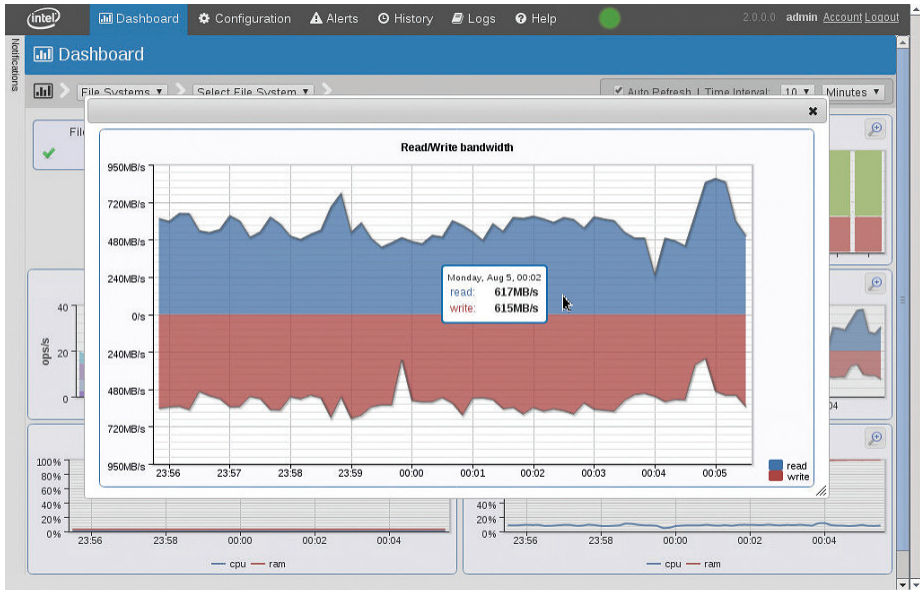
- Monitor storage health and key performance indicators (KPIs) in real time
- View high level system performance or individual components
- Generate historical and real-time charts and reports

Advanced troubleshooting tools

- Consolidated view of cluster-wide storage log files
- Intelligent log-scanning for efficient problem isolation and analysis
- Configurable event notifications

Open, documented APIs

- REST-compliant APIs for easy integration with other storage systems and software management tools
- Storage plug-in architecture provides easy extensibility



Intel Manager for Lustre software interfaces allow insights into high-level system performance or in-depth focus into individual components.

Apache Hadoop* Adapter

When organizations operate both Lustre and Apache Hadoop* within a shared infrastructure, there is a strong case for using Lustre as the file system for Hadoop analytics as well as HPC storage.

Intel EE for Lustre software includes an Intel-developed adapter which allows users to run Map/Reduce* applications directly on Lustre. This optimizes the performance of Map/Reduce operations while delivering faster, more scalable and easier to manage storage.

- Hadoop users can access any Lustre files directly from Hadoop, without the need to copy them to the Hadoop environment
- Using Lustre in combination with Hadoop makes storage management simpler—since the platform will be running a single Lustre file system instance rather than Hadoop instances for each cluster—and makes more productive use of storage assets.

For more information on Intel® Enterprise Edition for Lustre* Software, visit the Intel Lustre Portal at **Lustre.intel.com**

[1] www.top500.org.

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