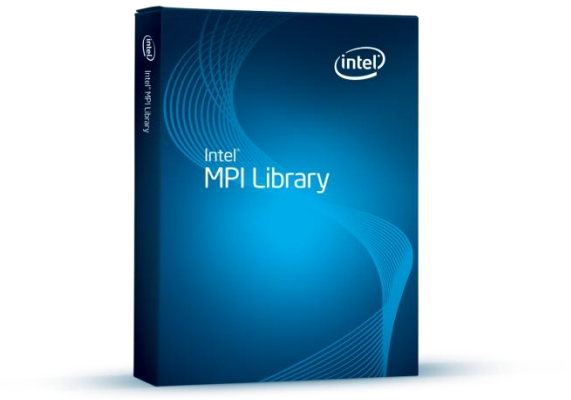
Intel® MPI Library 4.0

Product Brief

Intel® MPI Library 4.0 Update 3
For Windows* and Linux*



"As we scale our astrophysics codes and our clusters to handle larger and larger simulations, the Intel® MPI Library continues to deliver on scaling, performance, and stability."

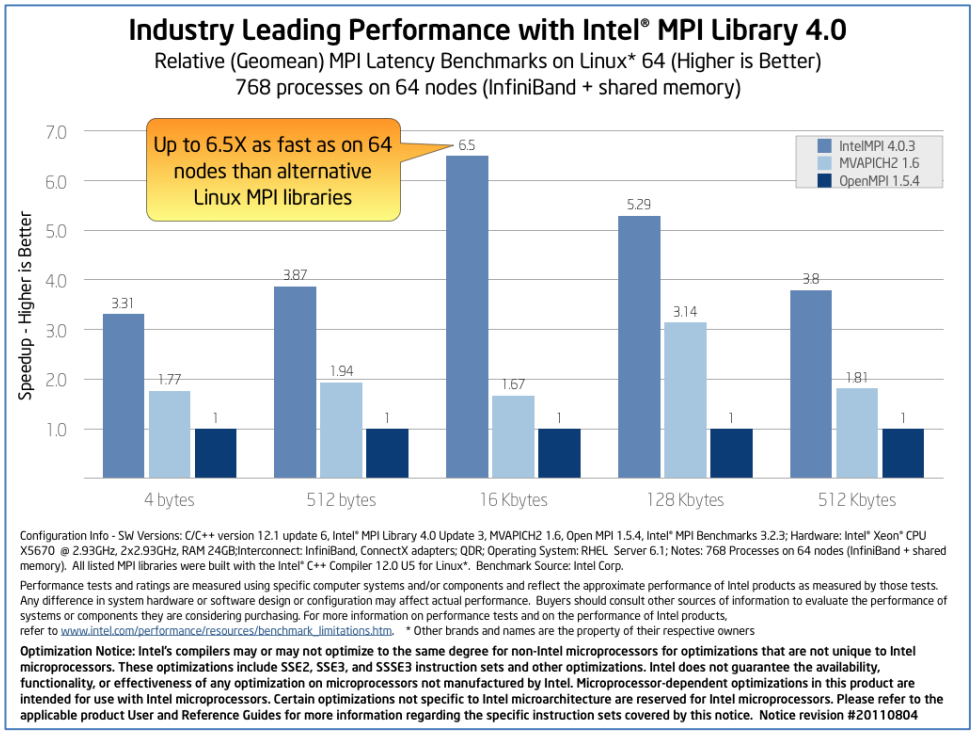
Ue-Li Pen, Associate Director at Canadian Institute for Theoretical Astrophysics, University of Toronto

Deliver Flexible, Efficient Cluster Messaging

- Scalability Beyond 90K Processes
- Interconnect Independence
- Scalable Process Management
- Runtime Fabric Selection

Intel® MPI Library focuses on making applications perform better on Intel® architecture-based clusters—implementing the high performance Message Passing Interface Version 2.1 specification on multiple fabrics. It enables you to quickly deliver maximum end user performance even if you change or upgrade to new interconnects, without requiring changes to the software or operating environment.

Use this high performance MPI library to develop applications that can run on multiple cluster interconnects chosen by the user at runtime. Benefit from a free runtime environment kit for products developed with the Intel MPI library. Get excellent performance for enterprise, divisional, departmental, workgroup, and personal High Performance Computing.



Intel® MPI Library (Intel® MPI) provides reduced MPI latency which can result in faster throughput.

Intel MPI Library Supports Multiple Hardware Fabrics

Whether you need to run TCP sockets, shared memory, or one of many Remote Direct Memory Access (RDMA) based interconnects, including InfiniBand*, Intel MPI Library covers all your configurations by providing an accelerated universal, multifabric layer for fast interconnects via the Direct Access
Programming Library (DAPL*) or the Open Fabrics Association (OFA*) methodology. Develop MPI code independent of the fabric, knowing it will run efficiently on whatever fabric is chosen by the user at runtime.

Additionally, the Intel® MPI Library provides new levels of performance and flexibility for applications achieved through improved interconnect support for Myrinet* MX and QLogic* PSM interfaces, faster on-node messaging and an application tuning capability that adjusts to the cluster architecture and application structure.

Intel MPI Library dynamically establishes the connection, but only when needed, which reduces the memory footprint. It also automatically chooses the fastest transport available. Memory requirements are reduced by several methods including a two-phase communication buffer enlargement capability which allocates only the memory space actually required.

Features

Feature	Benefit
Performance	• Enjoy excellent performance for enterprise, divisional, departmental, workgroup, and personal High Performance Computing • Deploy optimized shared memory dynamic connection mode for large SMP nodes • Improve latency with RDMA over Converged Ethernet (RoCE) support through the DAPL fabric • Increase performance with improved DAPL and OFA fabric support • Accelerate your applications using the enhanced tuning utility for MPI
Streamlined Product Setup	• Get users up and running faster with the ability to install under root or through an ordinary user ID • Use the provided mpivars.sh and mpivars.csh shell scripts for easy environment setup
Multiple Hardware Fabrics	• Get high-performance interconnects, including InfiniBand*, Myrinet*, as well as TCP, shared memory, and others • Efficiently work through the Direct Access Programming Library (DAPL*), Open Fabrics Association (OFA*), and Tag Matching Interface (TMI*), making it easy for you to test and run applications on a variety of network fabrics. • Optimizations to all levels of cluster fabrics: from shared memory thru Ethernet and RDMA-based fabrics to the tag matching interconnects
Scalability	• Low overhead allows random access to portions of a trace, making it suitable for analyzing large amounts of performance data. • Thread safety allows you to trace multithreaded MPI applications for event-based tracing as well as non-MPI threaded applications. • Improved start scalability through the mpiexec.hydra process manager • TCP scalability improvements
Simplified Process Management	• Reduce hand-coding work by using the mpirun script which automates multiprocessing daemon (MPD) startup and cleanup • Take advantage of the flexible system-, user-, and session-specific configuration files • Give the end user a reliable runtime with transparent support for fallback Internet Protocol (IP) interfaces • Integrate with SLURM* job management systems through the mpiexec.hydra process manager
Environment Variables for Runtime Control	• Increase performance with the ability to use device-specific and collective-protocol thresholds • Boost performance with memory registration cache • Get more accurate measurements with platform-specific finegrain timers
Multiple OS support	• Available for Microsoft Windows* OS or Linux* OS

Intel MPI Library 4.0 is available in the following packages:

- Intel MPI Library 4.0 Free Runtime Environment for pre-installation or redistribution
- Intel MPI Library 4.0 Software Development Kit including compilation tools, interface (static) libraries, debug libraries, trace libraries, include files and modules, and test codes

Intel MPI Library 4.0 Interoperability

Standards Based: Intel MPI Library is based on Argonne National Laboratory's MPICH-2 implementation. All MPI-2.1 features are supported.

Purchase Options: Language Specific Suites

Several suites are available combining the tools to build, verify and tune your application. The products covered in this product brief are highlighted in green. Single or multi-user licenses and volume, academic, and student discounts are available.

	Suites >>	Intel® Parallel Studio XE	Intel® C++ Studio XE	Intel® Fortran Studio XE	Intel® Composer XE	Intel® C++ Composer XE	Intel® Fortran Composer XE	Intel® Cluster Studio XE	Intel® Cluster Studio
Components	Intel® C / C++ Compiler	●	●		●	●		●	●
	Intel® Fortran Compiler	●		●	●		●	●	●
	Intel® Integrated Performance Primitives[3]	●	●		●	●		●	●
	Intel® Math Kernel Library[3]	●	●	●	●	●	●	●	●
	Intel® Cilk™ Plus	●	●		●	●		●	●
	Intel® Threading Building Blocks	●	●		●	●		●	●
	Intel® Inspector XE	●	●	●				●	
	Intel® VTune™ Amplifier XE	●	●	●				●	
	Static Security Analysis	●	●	●				●	
	Intel® MPI Library							●	●
	Intel® Trace Analyzer & Collector							●	●
	Rogue Wave IMSL* Library[2]						●		
	Operating System[1]	W, L	W, L	W, L	W, L	W, L, M	W, L, M	W, L	W, L

Note: (1)[1] Operating System: W=Windows, L= Linux, M= Mac OS* X. (2)[2] Available in Intel® Visual Fortran Composer XE for Windows with IMSL*
(3)[3] Not available individually on Mac OS X, it is included in Intel® C++ & Fortran Composer XE suites for Mac OS X

Technical Specifications	
Processor support	**Validated for use with multiple generations of Intel® and compatible processors including but not limited to: 2nd Generation Intel® Core™2 processor, Intel® Core™2 processor, Intel® Core™ processor, Intel® Xeon™ processor, .**
Operating systems	**Windows* and Linux***
Programming languages	**Natively supports C, C++ and Fortran development**
System requirements	**Please refer to www.intel.com/software/products/systemrequirements/ for details on hardware and software requirements.**
Support	**A free Runtime Environment Kit is available to run applications that were developed using Intel MPI Library** **All product updates, Intel® Premier Support services and Intel® Support Forums are included for one year. Intel Premier Support gives you confidential support, technical notes, application notes, and the latest documentation. Join the Intel® Support Forums community to learn, contribute, or just browse! http://software.intel.com/en-us/forums.**

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Optimization Notice

Notice revision #20110804

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