

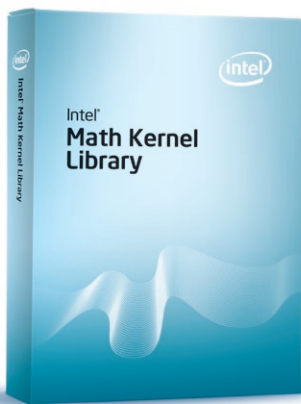


Intel® Math Kernel Library 10.2

for Windows*, Linux*, and Mac OS* X

Product Brief

Intel® Math Kernel Library 10.2
for Windows*, Linux*, and Mac OS* X



**“Intel MKL is indispensable
for any high performance
computer user on x86
platforms.”**

*Prof. Jack Dongarra
Innovative Computing Lab
University of Tennessee, Knoxville*

The Flagship for High-Performance Computing Math Software for Windows*, Linux*, and Mac OS* X

Intel® Math Kernel Library (Intel® MKL) 10.2 for Windows*, Linux*, and Mac OS* X is a library of highly optimized, extensively threaded math routines for science, engineering, and financial applications that require maximum performance.

Availability

- Intel® C++ Compiler Professional Editions (Windows, Linux, Mac OS X)
- Intel® Fortran Compiler Professional Editions (Windows, Linux, Mac OS X)
- Intel® Cluster Toolkit Compiler Edition (Windows, Linux)
- Intel® Math Kernel Library 10.2 (Windows, Linux)

Functionality

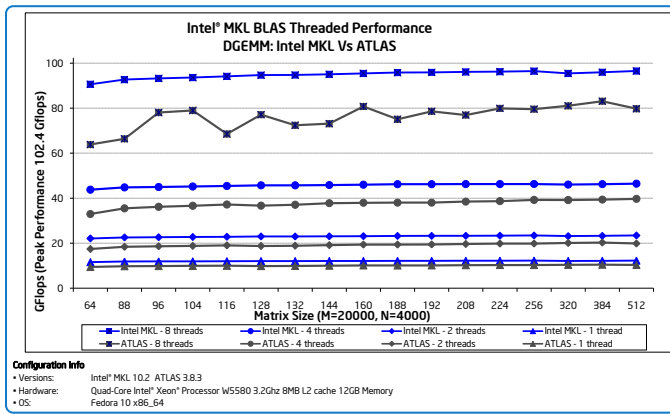
- Dense Linear Algebra—BLAS*, LAPACK*, Trust Region Solver
- Sparse Linear Algebra—Sparse BLAS, Sparse Format Converters
- Sparse Solvers—PARDISO* Direct Sparse Solver, Iterative Sparse Solvers and Pre-conditioners
- Fast Fourier Transforms
- Optimized LINPACK benchmark
- Vector Math Library
- Vector Random Number Generators
- Cluster Support—ScaLAPACK*, Cluster FFT

Features and Benefits

- Automatic parallelization
- Outstanding performance—multicore and multiprocessor ready
- Extensive parallelism and scaling
- Royalty free redistribution
- Standard APIs in C and Fortran
- Documented wrapper examples for C#/Net* support
- World-class technical support, knowledge base, and active Intel MKL forum

BLAS and LAPACK

Intel MKL provides extremely well-tuned BLAS and LAPACK implementations that deliver significant performance leadership over alternative math libraries.

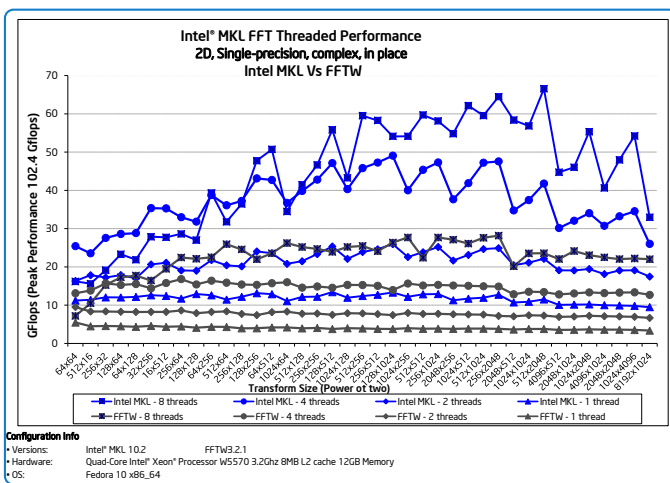


ScaLAPACK

Intel MKL includes a highly optimized version of ScaLAPACK on clusters and delivers significant performance improvements over the NETLIB* implementation.

Fast Fourier Transforms and Cluster FFT

Intel MKL Fast Fourier Transforms are highly optimized and provide significant performance gains over alternative libraries for medium and large transform sizes. FFTW interface wrappers are included. Support for distributed memory systems (clusters) is included with Cluster FFT.



Vector Random Number Generators

Intel MKL Vector Statistical Library (VSL) is a collection of 9 random number generators and 22 probability distributions that deliver significant performance improvements in physics, chemistry, and financial analysis.

Random-Number Generators		Probability Distributions	
Pseudo-random		Continuous	Discrete
Multiplicative Congruential 59-bit		Uniform	Uniform
Multiplicative Congruential 31-bit		Gaussian	UniformBits
Multiple Recursive		GaussianMV	Bernoulli
Feedback shift register		Exponential	Geometric
Wichman-Hill		Laplace	Binomial
Mersenne Twister 19937		Weibull	Hypergeometric
Mersenne Twister 2203		Cauchy	Poisson PTPE
Quasi-random		Rayleigh	Poisson Norm
Sobol		Lognormal	Poisson V
Niederreiter		Gumbel	Negative Binomial
		Gamma	—
		Beta	—

Sparse Solvers

The library includes both direct and iterative sparse solvers:

Direct solvers—PARDISO: A threaded, high-performance, memory efficient solver for large sparse linear systems of equations. Includes support for out-of-core memory.

Iterative solvers—FGMRES* and Conjugate Gradient Solvers: FGMRES adds the capability to solve general sparse systems of linear equations while the Conjugate Gradient solver solves symmetric positive-definite systems

Vector Math Library

Intel MKL provides vector implementations of computationally intensive core mathematical functions. These include:

Math	Power, Root	Trig	Hyper	Tounding	Exp, Log Special
Add	Pow	Cos	Cosh	Floor	Exp
Sub	Powx	Sin	Sinh	Ceil	Expml
Div	Pow2o3	SinCos	Tanh	Round	Ln
Sqr	Pow3o2	Cis	Asinh	Trunc	Log10
Mul	Sqrt	Tan	Acosh	Rint	Log1p
Conj	Cbrt	Acos	Atanh	NearbyInt	Erf
MulByConj	InvSqrt	Asin	-	Modf	Erfc
Abs	InvCbrt	Atan			ErfInv
Inv	Hypot	Atan			

Optimized LINPACK benchmark

The Intel MKL package includes an optimized implementation of the LINPACK benchmark which is easy to run on any Intel architecture platform and provides the best performance on the latest Intel processors, getting close to the maximum Gflops supported by the underlying platform.

“By adopting the Intel MKL DGEMM libraries, our standard benchmarks timing improved between 43 percent and 71 percent...”

*Matt Dunbar
Software Developer,
ABAQUS, Inc.*

Performance

Use the highly optimized Intel MKL to achieve outstanding performance on Intel® Xeon®, Intel® Core™ i7, Intel® Core™, Intel® Pentium®, and Intel® Itanium® processor-based systems. Intel MKL strives for competitive performance on Intel® architecture compatible processors, which makes it the best choice for developers across all x86 platforms.

Compatibility

Intel MKL runs on a variety of workstations, servers, and personal computers running Linux, Windows, and Mac OS X operating systems. For details on hardware and software requirements please refer to www.intel.com/software/products/systemrequirements/.

Support

Every purchase of Intel MKL includes one year of free upgrades, Intel® Premier Support, MKL user forum, and Intel knowledge base access.

Share experiences with other users of Intel MKL at the Intel-moderated Intel® MKL Discussion Forum at: <http://softwarecommunity.intel.com/isn/Community/en-US/forums/1273/ShowForum.aspx>.

Download a trial version today.
www.intel.com/software/products/mkl

