Intel® Math Kernel Library 10.1
for Windows*, Linux*, and Mac OS* X

Product Brief

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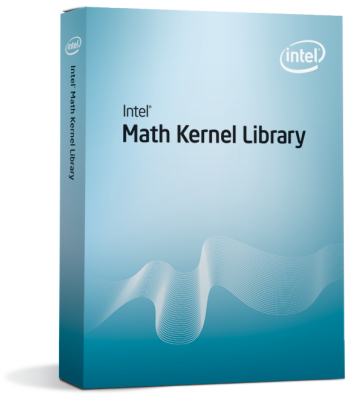
for Windows*, Linux*, and Mac OS* X



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

Matt Dunbar
Software Developer,
ABAQUS, Inc.

The Flagship for High-Performance Computing Math Software

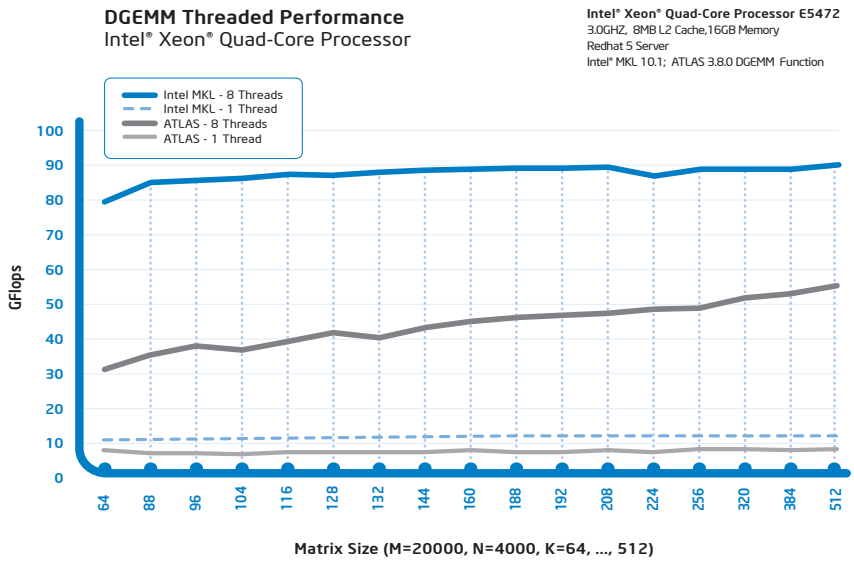
Intel® Math Kernel Library (Intel® MKL) is a library of highly optimized, extensively threaded math routines for science, engineering, and financial applications that require maximum performance.

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 10.1 (Windows, Linux, Mac OS X)

Functionality

- Linear Algebra—BLAS and LAPACK
- Linear Algebra—ScaLAPACK
- Linear Algebra—Sparse Solvers
- Fast Fourier Transforms
- Vector Math Library
- Vector Random Number Generators



Features and Benefits

- Outstanding performance
- Multicore and multiprocessor ready
- Extensive parallelism and scaling
- Royalty free redistribution
- Standard APIs in C and Fortran
- World-class technical support

BLAS and LAPACK

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

ScaLAPACK

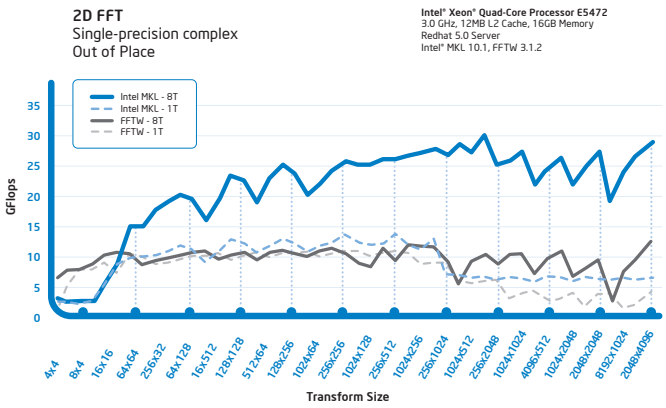
Intel MKL includes a highly optimized version of ScaLAPACK regardless of block size and delivers significant performance improvements over the NETLIB* implementation.

Fast Fourier Transforms

Intel MKL Fast Fourier Transforms are highly optimized and provide significant performance gains over alternative libraries for medium and large transform sizes.

Features

- Outstanding multiprocessor scaling
- Modern easy-to-use interface
- FFTW interface wrappers for current FFTW users
- Support for distributed memory systems (clusters)



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
Pseudo-random
Multiplicative Congruential 59-bit
Multiplicative Congruential 31-bit
Multiple Recursive
Feedback shift register
Wichman-Hill
Mersenne Twister 19937
Mersenne Twister 2203
Quasi-random
Sobol
Niederreiter

Probability Distributions	
Continuous	Discrete
Uniform	Uniform
Gaussian	UniformBits
GaussianMV	Bernoulli
Exponential	Geometric
Laplace	Binomial
Weibull	Hypergeometric
Cauchy	Poisson PTPE
Rayleigh	Poisson Norm
Lognormal	Poisson V
Gumbel	Negative Binomial
Gamma	—
Beta	—

Sparse Solvers

The library includes both direct and iterative sparse solvers:

Direct—PARDISO: A threaded, high-performance, memory efficient solver for large sparse linear systems of equations. Version 10.0 introduced support for out-of-core memory!

Iterative—FGMRES and Conjugate Gradient Solvers: FMGRES 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	Expm1
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			

Performance

Achieve outstanding performance from a math library that is highly optimized for Intel® Xeon®, Intel® Core™ i7, Intel® Itanium®, Intel® Pentium® and Intel® Core® 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/mkl.

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

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