AMD Opteron™ X1100 series Processor
AMD Opteron™ X2100 series APU
Compiler Options Quick Reference Guide

GNU compiler collection (gcc, g++, gfortran)

Latest release: 4.8.1, May 2013

http://gcc.gnu.org

Architecture	
Generate instructions that run on X1100/X2100	-march=btver2
Generate instructions for the local machine	-march=native

Optimization Levels	
Disable all optimizations (default)	-O0
Speed and code optimizations	-O1
More optimizations	-O2
Aggressive optimizations	-O3
Maximize performance	-Ofast

Additional Optimizations	
Schedule instructions	-fschedule-insns -fschedule-insns2 -fsched-pressure
Link time optimization	-flto
Enable unrolling	-funroll-all-loops
Generate prefetch instructions for loops	-fprefetch-loop-arrays --param prefetch-latency=300 (300-700)
Inline string operations	-minline-all-stringops
Link to ACML 5.3.1	-L/opt/acml5.3.1/ gfortran64_int64/lib -lacml
OpenMP	-fopenmp
Profile guided optimization	-fprofile-generate and -fprofile-use
Turn off partial redundancy elimination	-fno-tree-pre
Disable deriving upper bound for number of iterations of loops	-fno-aggressive-loop-optimizations
Vectorization	-ftree-vectorize

Other options	
Enable generation of code that follows IEEE arithmetic	-mieee-fp
Enable faster, less precise math operations	-ffast-math
Compile free form FORTRAN	-ffree-form
OpenMP threads and affinity	export OMP_NUM_THREADS=4 export GOMP_CPU_AFFINITY="0-3"

Microsoft Visual Studio 2012 and 2013

Latest release: September 2012

http://msdn.microsoft.com/en-us/library/fwkeyyhe.aspx

http://msdn.microsoft.com/en-us/library/vstudio/60k1461a.aspx

http://www.microsoft.com/visualstudio

Architecture	
Generate instructions that run on X1100/X2100	/arch:AVX
Favor AMD architecture (x64 only)	/favor:AMD64

Optimization Levels	
Maximize performance	/O2
Eliminate unreferenced function and/or data	/OPT:REF
Perform identical COMDAT folding	/OPT:ICF
Outputs an informational message for loops that are auto-vectorized	/Qvec-report:1
Enable automatic parallelization of loops marked with the #pragma loop() directive	/Qpar

Additional Optimizations	
Maintain the precision for floating-point operations through proper rounding	/fp:precise
Optimize floating-point code for speed at the expense of floating-point accuracy and correctness	/fp:fast
Whole Program Optimization	/GL
Profile guided optimization	/LTCG:PGI and /LTCG:PGO
Link to ACML 5.3.1	\acml5.3.1\ifort64\lib\libacml_dll.lib

For more information, visit http://developer.amd.com

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Intel compilers (icc, icpc, ifort)

Latest release: 13.1.0, January 2013

http://software.intel.com

Architecture	
Generate instructions that run on X1100/X2100	–msse4.2

Optimization Levels	
Disable all optimizations	-O0
Speed optimization without code growth	-O1
Enable optimization including vectorization	-O2
Aggressive optimization	-O3
Maximize performance	-fast

Additional Optimizations	
Aggressive unrolling	-unroll-aggressive
Disable improved precision floating divides	-no-prec-div
Enable vectorization	-vec
Inter procedural Optimization	-ipo
Link to ACML 5.3.1	-L/opt/acml5.3.1/ifort64_int64/lib -lacml
OpenMP	-openmp
Prefetch optimization	-opt-prefetch
Profile generated optimization	-prof-gen and -prof-use
Use optimized header definitions	-use-intel-optimized-headers

Other options	
Floating point accuracy tuning	-fp-model
Compile free form FORTRAN	-free

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