Software/Library				CPU Architectures												GPU									Interconnect									Note
Role	Standard	Name	Usage	Intel x86			AMD x86			NVIDIA Arm (Grace)			Fujitsu Arm			Intel			AMD			NVIDIA			InfiniBand			SlingShot			ToFu			
役割	標準化・API名	ソフトウェア名	利用実績	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	MIJ / NMIJ	Prop / OSS	New / CICD	
#workload-manager	N/A	Slurm	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NS	NS	NS	
#workload-manager	N/A	flux	Low	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NS	NS	NS	
#high-level-communication-library	MPI	Fujitsu MPI	High	MIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	MIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	MIJ	Prop	CDCI	NS	NS	NS	MIJ	Prop	CDCI	3D, 6D torusを用いた通信ノスケジュールなどの高速効率化機能を有する
#high-level-communication-library	MPI	Intel MPI	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	
#high-level-communication-library	MPI	NVIDIA HPC-X	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	InfiniBandのオフロード機能やGPU Direct機能を活用した実装
#high-level-communication-library	MPI	Open MPI	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	NS	NS	NS	NS	NS	NS	Open MPI, MVAPICH, MPICH-OSいずれかは対応機能
#high-level-communication-library	MPI	MVAPICH	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	NS	NS	NS	NS	NS	NS	Open MPI, MVAPICH, MPICH-OSいずれかは対応機能
#high-level-communication-library	MPI	MPICH	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	NS	NS	NS	REF	REF	REF	Open MPI, MVAPICH, MPICH-OSいずれかは対応機能。高速向けの実装例が（非サポート）。
#middle-level-communication-library	UCX	UCX	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	REF	REF	REF	文明システムでUCXを実装できれば、Open MPI, MPICH-OS実装可能等。高速向けの実装例が（非サポート）。
#middle-level-communication-library	UCC	UCC	Low	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NS	NS	NS	文明システムでUCCを実装できれば、Open MPI の集団通信最適化が可能。UCXに依存。
#middle-level-communication-library	OFED	OFED	Low	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	NS	NS	NS	NS	NS	NS	Lustreがデフ゛ロ゛イでして利用。
#light-weight kernel	Linux	McKernel	High	MIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	MIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#OS	Linux	TOSS	Low	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#container	container	Docker/Podman/Singularity/CharlieCloud/他	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	MIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	Fortran	GNU Compiler Collection Fortran	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	MIJ	OSS	CDCI	NMIJ	UK	UK	NMIJ	OSS	New (partially supported)	NMIJ	OSS	New (partially supported)	UK	UK	UK	UK	UK	UK	UK	UK	UK	GnuがGPUサポートは部分的
#compiler	C	GNU Compiler Collection C	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	MIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	New (partially supported)	NMIJ	OSS	New (partially supported)	UK	UK	UK	UK	UK	UK	UK	UK	UK	GnuがGPUサポートは部分的
#compiler	C++	GNU Compiler Collection C++	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	MIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	New (partially supported)	NMIJ	OSS	New (partially supported)	UK	UK	UK	UK	UK	UK	UK	UK	UK	GnuがGPUサポートは部分的
#compiler	Fortran	LLVM/Flang	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	MIJ	OSS	CDCI	NMIJ	OSS	COCD	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C	LLVM/Clang	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	MIJ	OSS	CDCI	NMIJ	OSS	COCD	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C++	LLVM/Clang++	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	MIJ	OSS	CDCI	NMIJ	OSS	COCD	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#debugger	-	Arm Allinea Studio, Arm Forge	Low	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#profiler	-	TotalView	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C	Arm Allinea Studio, Arm C Compiler for Linux	Mid	NS	NS	NS	NS	NS	NS	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM
#compiler	C++	Arm Allinea Studio, Arm C++ Compiler for Linux	Mid	NS	NS	NS	NS	NS	NS	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM
#compiler	C	Arm Allinea Studio, Arm Fortran Compiler for Linux	Mid	NS	NS	NS	NS	NS	NS	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM
#compiler	oneAPI	Intel® oneAPI C compiler	High	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM
#compiler	oneAPI, SYCL	Intel® oneAPI DPC++/C++ compiler	High	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM
#compiler	oneAPI	Intel® oneAPI Fotran compiler	High	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM
#compiler	oneAPI, SYCL	Intel® oneAPI DPC++ compiler	Mid	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on LLVM, native CPUバックエンドが可能。ただFujitsu Arm Processor で動作するかは不明。
#compiler	Python	Intel Distribution for Python	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	Based on OSS Intel Python
#compiler	Python	Intel Python	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#communication-tool	SYCL	Data Parallel Control	Low	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#debugger	-	GDB	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	cuda-gdb対応して
#debugger	-	Intel Distribution for GDB	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	AMDは正式サポート対象外
#debugger	-	Intel Inspector	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	Prop	CDCI	CDCI	NMIJ	Prop	NS	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	AMDは正式サポート対象外
#profiler	-	perf	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#profiler	-	Intel VTune Profiler	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	AMDは正式サポート対象外
#profiler	-	Intel Advisor	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	AMDは正式サポート対象外
#profiler	-	Intel Trace Analyzer and Collector	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	AMDは正式サポート対象外
#profiler	-	Intel Profiling Tools Interfaces for GPU	Mid	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, Prop
#profiler	PAPI	PAPI	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	CPU及びcuda papi 等として対応
#porting-tool	oneAPI	Intel DPC++ Compatibility Tool	Low	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, Prop
#porting-tool	oneAPI	SYCLomatic	Low	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, OSS
#hardware-abstraction-library	oneAPI	oneAPI Level Zero	Low	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#runtime-library	oneAPI	Intel Compute Runtime for oneAPI Level Zero and OpenCL	Mid	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#library	oneAPI	Intel oneAPI DPC++ Library	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	based on oneAPI DPC++ library
#library	oneAPI	oneAPI DPC++ Library	Mid	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#library	oneAPI	Intel oneAPI Threading Building Blocks	Mid	NMIJ	Prop	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	based on oneAPI Threading Building Block
#library	oneAPI	oneAPI Threading Building Blocks	Mid	NMIJ	OSS	CDCI	UK	UK	UK	NS	NS	NS	NS	NS	NS	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#programming-framework	Kokkos	Kokkos	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#programming-framework	CUDA	CUDA	Mid	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, Prop
#compiler	C	NVIDIA HPC Compilers C	High	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C++	NVIDIA HPC Compilers C++	High	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	Fortran	NVIDIA HPC Compilers Fortran	High	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#profiler	-	Nsight Compute	Mid	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#debugger	-	Nsight Compute	Mid	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#profiler	-	Nsight Systems	Mid	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	-	CUDA Quantum	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	-	cuQuantum	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	UK	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C	AMD Optimizing C/C++ and Fortran compilers (AOCC) C	Mid	NS	NS	NS	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C++	AMD Optimizing C/C++ and Fortran compilers (AOCC) C++	Mid	NS	NS	NS	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	Fortran	AMD Optimizing C/C++ and Fortran compilers (AOCC) Fotran	Mid	NS	NS	NS	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#profiler	-	AMD uProf ("RICRO-prof")	Mid	NS	NS	NS	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compile	C++, CUDA	AMD ROCm ROCmCC	Mid	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, OSS
#debugger	-	ROCm Validation Suite	Low	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, OSS
#compiler	OpenCL	AMD ROCm OpenCL	Mid	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, OSS
#compiler	C	HPE Cray C Compiler	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	C++	HPE Cray C++ Compiler	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	Fortran	HPE Cray Fortran Compiler	Mid	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	NMIJ	Prop	CDCI	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#profiler	-	DynamoRIO	Low	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	Prop	UK	NMIJ	Prop	UK	NMIJ	Prop	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#compiler	Python	Python	High	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	UK	NMIJ	OSS	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPUにて入りはGPU対応のライブラリが呼び出しが可能
#compiler	Python	CUDA Python	Mid	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	OSS	NS	NMIJ	OSS	NS	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU用, NMIJ, OSS
#compiler	Java	Java	Low	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#programming-framework	OpenMP	OpenMP	High	NMIJ	Prop/OSS	CDCI	NMIJ	Prop/OSS	CDCI	UK	UK	UK	MIJ/NMIJ	Prop/OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#programming-framework	HIP	HIP	Mid	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	NS	NMIJ	Prop	CDCI	NMIJ	Prop	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#debugger	-	LTTng	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU向けは開発中の部分もあり
#debugger	-	Valgrind	Mid	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	NMIJ	OSS	CDCI	NMIJ	OSS	UK	NMIJ	OSS	CDCI	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	GPU向けは開発中の部分もあり
#Math-library	BLAS	Netlib BLAS	Low	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	LAPACK	Netlib LAPACK	Low	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	PBLAS	Netlib PBLAS	Low	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	ScaLAPACK	Netlib ScaLAPACK	High	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	BLAS	OpenBLAS	High	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	BLAS	BLIS	High	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	BLAS	MKL BLAS	High	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	LAPACK	MKL LAPACK	High	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	PBLAS	MKL PBLAS	High	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	ScaLAPACK	MKL ScaLAPACK	High	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	BLAS	cuBLAS	High	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI?	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	LAPACK+other	cuSOLVER	High	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI?	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	BatchedBLAS	NLAFET Batched BLAS	Low	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	BatchedBLAS	Batched BLAS Generator	Low	MIJ	OSS	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	EVD	ELPA	High	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	EVD	EigenExa	High	MIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	MKL Inspector-executor SparseBLAS		NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	cuSPARSE	High	NS	NS	NS	NS	NS	NS	NMIJ	Prop	UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	MKL sparseQR		NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	UMFPACK/SuiteSparse	Low	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library		MUMPS	High	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	SuperLU	Mid	NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	Dissection	Low	MIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	MKL PARDISO	High	NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	cuSolverSP		NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	NS	NS	NS	NMIJ	Prop	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	Sparse	MKL Parallel Direct Sparse Solver for Clusters Interface		NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	NS	NS	UK	UK	UK	NS	NS	NS	NS	NS	NS	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	general	IML++		NMIJ	Prop?	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	precond	UK		NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	precond	GAMG		NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	SparseLIN	PETSc		NMIJ	OSS	CDCI	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	UK	
#Math-library	SparseLIN	MKL RCI CG/FGMRES		NMIJ	Prop	CDCI	NS	NS	NS	NS	NS	NS	NS	N

			Software	Owner	Open/Closed	Langauges Supported	HardwareSupported	Link
Data	versioning		Pachydern	Pachydern	Closed	Python; Java; Scala	Various CPUs	https://www.pachyderm.com
			DVC	iterative.ai	Closed	Python	Various CPUs	https://dvc.org
			DoltHub	DoltHub Inc.	Closed	SQL	Various CPUs	https://www.dolthub.com
	Labeling		Figure Eight	Figure Eight Inc.	Closed	Proprietary	Various CPUs	https://www.figure-eight.com/
			Scale	Scale AI	Closed	Proprietary	Various CPUs	https://scale.com
			Aquarium	Aquarium	Closed	Proprietary	Various CPUs	https://www.aquariumlearning.com
	Processing		Apache Spark	Apache Foundation	Open	Java; Scala; Python; R	Various CPUs	https://spark.apache.org
			Dagster	Dagster	Open	Python; Proprietary	Various CPUs	https://dagster.io
			Apache Airflow	Apache Foundation	Open	Python	Various CPUs	https://airflow.apache.org
	Exploration		Pandas	NumFOCUS	Open	Python	Various CPUs/GPUs	https://pandas.pydata.org
			RAPIS	Nvidia	Open	CUDA	Nvidia GPUs	https://rapids.ai
			DBT AI	DBT	Open	Python	Various CPUs	https://pypi.org/project/dbt-ai/
	Data Lake /Warehouse		Snowflake	Snowflake	Closed	SQL	Various CPUs	https://www.snowflake.com/en/
			databricks	Databricks	Semi-open	SQL	Various CPUs	https://www.databricks.com
	Sources		AWS S3	Amazon	Closed	Proprietary	Various CPUs	https://aws.amazon.com/s3/
			Apache Parquet	Apache Foundation	Open	Multiple	Various CPUs	https://parquet.apache.org
			PostgreSQL	PostgreSQL	Open	SQL	Various CPUs	https://www.postgresql.org
Training /Evaluation	Frameworks & Distributed Training	Frameworks	PyTorch (Torch)	Meta	Open	Multiple	Various CPUs/GPUs	https://pytorch.org
			TensorFlow	Google	Open	Multiple	Various CPUs/GPUs/TPUs	https://www.tensorflow.org
			Apache MXNet	Apache Foundation	Open	Multiple	Various CPUs/GPUs	https://mxnet.apache.org/
			PaddlePaddle	PaddlePaddle	Open	Multiple	Various CPUs/GPUs	https://github.com/PaddlePaddle/Paddle
			NNABLA	Sony	Open	Multiple	Various CPUs/GPUs	https://nnabla.org
			RAY	Anyscale Inc.	Open	Multiple	Various CPUs/GPUs	https://www.ray.io
			JAX	Google	Open	Multiple	Various CPUs/GPUs/TPUs	https://jax.readthedocs.io/en/latest/#
			Colossal-AI	Colossal-AI	Open	Python	Nvidia GPUs	https://colossalai.org
		Wrapper frameworks	Keras (TF)	Google	Open	Python	Various CPUs/GPUs/TPUs	https://keras.io
			Gluon (MXNet)	Gluon	Open	Python	Nvidia GPUs	https://auto.gluon.ai/stable/index.html
			fastai	fast.ai	Open	Multiple	Various CPUs/GPUs	https://github.com/fastai/fastai
			DGL (TF; PyTorch; MXNet)	DGL	Open	Python	Various CPUs/GPUs	https://www.dgl.ai
		Extensions	Lightning (PyTorch)	Lightning AI	Open	Python	Various CPUs/GPUs	https://lightning.ai
			DeepSpeed	Microsoft	Open	Python	Various CPUs/GPUs	https://www.deepspeed.ai
			Pytorch Geometric	Meta	Open	Python	Various CPUs/GPUs	https://pytorch-geometric.readthedocs.io
			Sonnet (TF)	DeepMind	Open	Python	Various CPUs/GPUs	https://sonnet.readthedocs.io/en/latest/#
		Communicators	Horovod	Uber	Open	Python	Various CPUs/GPUs	https://horovod.readthedocs.io/en/stable/
			NCCL	Nvida	Closed	Python	Nvidia GPUs	https://developer.nvidia.com/nccl
		Backend	cuDNN	Nvidia	Closed	CUDA	Nvidia GPUs	https://developer.nvidia.com/cudnn
			oneDNN	Intel	Open	C++	Various CPUs	https://oneapi-src.github.io/oneDNN/group_dnnl_api.html
			hipDNN/MIOpen	AMD	Open	C++	Various CPUs/ AMD GPUs	https://github.com/ROCmSoftwarePlatform/hipDNN
		Numercial Libs & BLAS	LIBXSMM	LIBXSMM	Open	C++	Various CPUs	https://libxsmm.readthedocs.io
			CUPy	Preferred Networks	Open	Python	Various GPUs	https://cupy.dev
		Model Repository	Huggingface	Huggingface	Closed	N/A	N/A	https://huggingface.co
			Keras Applications	Google	Open	Python	Various CPUs/GPUs/TPUs	https://keras.io/api/applications/
		Model Exchange	ONNX	Meta/Microsoft	Open	Multiple wrappers	N/A	https://onnx.ai
	Hyperparameter Tuning		SigOpt	Intel	Semi-open	Multiple wrappers	Various CPUs/ Nvidia GPUs	https://sigopt.com
			Determind AI	Determind AI	Open	Python/CLI	Various CPUs/GPUs	https://www.determined.ai
			Optuna	Preferred Networks	Open	Python	Various CPUs	https://optuna.org
			Apache TVM	Apache Foundation	Open	Multiple	Various CPUs/GPUs	https://tvm.apache.org
	Experiment Management		Comet	Comet ML Inc.	Closed	Python	Various CPUs/GPUs	https://www.comet.com/site/
			Neptune	Neptune Labs	Open	Python	Various CPUs	https://neptune.ai
			MLflow	MLflow Project	Open	Python	Various CPUs	https://mlflow.org
			TensorBoard	Google	Open	Python	Various CPUs/GPUs/TPUs	https://www.tensorflow.org/tensorboard
			sacred	IDSIA	Open	Python	Various CPUs	https://github.com/IDSIA/sacred
			Weights & Biases	Weights & Biases	Closed	Python/ Web Interface	Various CPUs	https://wandb.ai/
	Resource Management		Slurm	Slurm	Open	C/C++	N/A	https://slurm.schedmd.com/documentation.html
Deployment			Fiddler	Fiddler	Closed	Web Interface	Various CPUs/GPUs	
			TensorFlow Lite	Google	Open	C/C++	Mobile/Edge	https://www.tensorflow.org/lite
			TorchScript	Meta	Open	C/C++	Various CPUs/GPUs	https://pytorch.org/docs/stable/jit.html
			Nvidia TensorRT(-LLM) Inference	Nvidia	Open	CUDA	Nvidia GPUs	https://developer.nvidia.com/tensorrt#inference
			Seldon	Seldon Tech. Ltd.	Closed	Multiple wrappers	Various CPUs/GPUs	https://www.seldon.io
			DataRobot	DataRobot Inc.	Closed	Multiple wrappers	Various CPUs/GPUs	https://www.datarobot.com
			Lambda	Lambda	Closed	Multiple wrappers	Various CPUs/GPUs	https://lambdalabs.com
			Buildkite	Buildkite	Closed	Multiple wrappers	Various CPUs/GPUs	https://buildkite.com