



NVIDIA HPC SDK RELEASE NOTES

RN-09976-001-V20.7 | August 2020



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Chapter 1.

WHAT'S NEW

This is the 20.9 release of the NVIDIA HPC SDK, a comprehensive suite of compilers and libraries enabling developers to program the entire HPC platform, from the GPU foundation to the CPU and through the interconnect.

Key features that are new in the 20.9 release of the NVIDIA HPC SDK for Linux include:

- ▶ NVIDIA HPC SDK 20.9 is a maintenance release providing multiple bugfixes and usability enhancements.
- ▶ A beta preview of Open MPI 4.0.5 built with support for UCX 1.9.0 is now available.
- ▶ The Fortran module for OpenMP has been split into two modules, 'omp_lib' and 'omp_lib_kinds'.
- ▶ HPC SDK library and developer tool components have been updated to their newest versions.

Chapter 2.

RELEASE COMPONENT VERSIONS

The NVIDIA HPC SDK 20.9 release contains the following versions of each component:

Table 1 HPC SDK Release Components

	Linux_x86_64			Linux_ppc64le			Linux_aarch64		
	CUDA 10.1	CUDA 10.2	CUDA 11.0	CUDA 10.1	CUDA 10.2	CUDA 11.0	CUDA 10.1	CUDA 10.2	CUDA 11.0
nvc++	20.9			20.9			20.9		
nvc	20.9			20.9			20.9		
nvfortran	20.9			20.9			20.9		
nvcc	10.1.243	10.2.89	11.0.228	10.1.243	10.2.89	11.0.228	N/A	N/A	11.0.228
NCCL	2.7.8-1	2.7.8-1	2.7.8-1	2.7.8-1	2.7.8-1	2.7.8-1	N/A	N/A	2.7.8-1
NVSHMEM	1.1.3	1.1.3	1.1.3	1.1.3	1.1.3	1.1.3	N/A	N/A	N/A
cuBLAS	10.2.1.243	10.2.2.89	11.2.0.252	10.2.1.243	10.2.2.89	11.2.0.252	N/A	N/A	11.2.0.252
cuFFT	10.1.1.243	10.1.2.89	10.2.1.245	10.1.1.243	10.1.2.89	10.2.1.245	N/A	N/A	10.2.1.245
cuRAND	10.1.1.243	10.1.2.89	10.2.1.245	10.1.1.243	10.1.2.89	10.2.1.245	N/A	N/A	10.2.1.245
cuSOLVER	10.2.0.243	10.3.0.89	10.6.0.245	10.2.0.243	10.3.0.89	10.6.0.245	N/A	N/A	10.6.0.245
cuSPARSE	10.3.0.243	10.3.1.89	11.1.1.245	10.3.0.243	10.3.1.89	11.1.1.245	N/A	N/A	11.1.1.245
cuTENSORFLOW	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	1.2.0	N/A	N/A	1.2.0
Nsight Compute	2020.1.0.33-28294165			2020.1.0.33-28294165			2020.1.0.33-28294165		
Nsight Systems	2020.3.1.54 CLI and GUI			2020.3.1.54 CLI			2020.3.1.54 CLI		
OpenMPI	3.1.5			3.1.5			3.1.5		
OpenMPI 4 (NVHPC beta)	N/A	N/A	4.0.5	N/A	N/A	4.0.5	N/A	N/A	4.0.5
UCX	N/A	N/A	1.9.0	N/A	N/A	1.9.0	N/A	N/A	1.9.0

	Linux_x86_64			Linux_ppc64le			Linux_aarch64		
	CUDA 10.1	CUDA 10.2	CUDA 11.0	CUDA 10.1	CUDA 10.2	CUDA 11.0	CUDA 10.1	CUDA 10.2	CUDA 11.0
OpenBLAS	0.3.10			0.3.10			0.3.10		
Scalapack	2.1.0			2.1.0			2.1.0		
Thrust	1.9.6	1.9.7	1.9.9	1.9.6	1.9.7	1.9.9	1.9.6	1.9.7	1.9.10
CUB	N/A	N/A	1.9.9	N/A	N/A	1.9.9	N/A	N/A	1.9.9
libcu++	N/A	1.0.0	2.0.0	N/A	1.0.0	2.0.0	N/A	1.0.0	2.0.0

Chapter 3.

SUPPORTED PLATFORMS

3.1. Platform Requirements for the HPC SDK

Table 2 HPC SDK Platform Requirements

Architecture	Linux Distributions	Minimum gcc/ glibc Toolchain	Minimum CUDA Driver
x86_64	CentOS 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8 CentOS 8.0, 8.1 Fedora 29, 30, 31, 32 OpenSUSE Leap 15.0, 15.1 RHEL 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10 RHEL 7.0, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.7, 7.8 RHEL 8.0, 8.1 SLES 12SP4, 12SP5, 15SP1 Ubuntu 14.04, 16.04, 18.04, 19.04, 19.10, 20.04	C99: 4.4 C11: 4.9 C++03: 4.4 C++11: 4.9 C++14: 5.1 C++17: 7.1	418.39
ppc64le	RHEL 7.3, 7.4, 7.5, 7.6, 7.7, 8.0, 8.1 RHEL Pegas 7.5, 7.6 Ubuntu 16.04, 18.04	C99: 4.4 C11: 4.9 C++03: 4.4 C++11: 4.9 C++14: 5.1 C++17: 7.1	410.45

Architecture	Linux Distributions	Minimum gcc/ glibc Toolchain	Minimum CUDA Driver
aarch64	RHEL 8.1 Ubuntu 18.04	C99: 4.4 C11: 4.9 C++03: 4.4 C++11: 4.9 C++14: 5.1 C++17: 7.1	450.36

3.2. Supported CUDA Toolkit Versions

The NVIDIA HPC SDK uses elements of the CUDA toolchain when building programs for execution with NVIDIA GPUs. Every HPC SDK installation package puts the required CUDA components into an installation directory called `[install-prefix]/[arch]/[nvhpc-version]/cuda`.

An NVIDIA CUDA GPU device driver must be installed on a system with a GPU before you can run a program compiled for the GPU on that system. The NVIDIA HPC SDK does not contain CUDA Drivers. You must download and install the appropriate [CUDA Driver from NVIDIA](#), including the [CUDA Compatibility Platform](#) if that is required.

The `nvaccelinfo` tool prints the Driver version as its first line of output. You can use it to find out which version of the CUDA Driver is installed on your system.

The NVIDIA HPC SDK 20.9 includes stand-alone support for the following CUDA toolchain versions:

- ▶ CUDA 10.1
- ▶ CUDA 10.2
- ▶ CUDA 11.0

See the NVIDIA HPC Compilers User Guide for information about using the HPC SDK Fortran, C++ and C compilers with alternative versions of the CUDA toolchain.

Chapter 4.

KNOWN LIMITATIONS

- ▶ The cuda-gdb debugger is included in this release. Currently, Fortran arrays with non-constant bounds are not handled correctly and querying values will yield incorrect results. Stepping through cuda-fortran and OpenACC kernels is partially supported, but incorrect line numbers are displayed. For additional general limitations with cuda-gdb, please refer to its documentation.
- ▶ When using `-stdpar` to accelerate C++ parallel algorithms, the algorithm calls cannot include virtual function calls or function calls through a function pointer, cannot use C++ exceptions, can only dereference pointers that point to the heap, and must use random access iterators (raw pointers as iterators work best)
- ▶ The Open MPI 4.0.5 build with UCX 1.9.0 is a beta feature in the NVIDIA HPC SDK 20.9. It is built with support for MOFED 5.0; users on systems using earlier MOFED versions may encounter compatibility issues.

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