



# COMPUTE SANITIZER

v2020.3.1 | February 2021

## Release Notes



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# Chapter 1.

## RELEASE NOTES

### 1.1. Updates in 2020.3.1

- ▶ Fixed issue when launching a CUDA graph multiple times.
- ▶ Fixed false positives when using cooperative groups synchronization primitives with `initcheck` and `synccheck`.

### 1.2. Updates in 2020.3

- ▶ Added support for CUDA memory pools and CUDA API reduced serialization.
- ▶ Added host backtrace for unused memory reports.

### 1.3. Updates in 2020.2.1

- ▶ Fixed crash when loading cubins of size larger than 2 GiB.
- ▶ Fix error detection on systems with multiple GPUs.
- ▶ Fixed issue when using CUDA Virtual Memory Management API `cuMemSetAccess` to remove access to a subset of devices on a system with multiple GPUs.
- ▶ Added public API to translate between sanitizer and CUDA stream handles.

### 1.4. Updates in 2020.2

- ▶ Added support for CUDA graphs and CUDA memmap APIs.
- ▶ The memory access callback of the public API has been split into three distinct callbacks corresponding to global, shared and local memory accesses.

## 1.5. Updates in 2020.1.2

- ▶ Added sanitizer stream API. This fixes tool crashes when per-thread streams are being used.

## 1.6. Updates in 2020.1.1

- ▶ Support for Windows Hardware-accelerated GPU scheduling
- ▶ Support for tracking child processes spawned by the application launched under the tool via the `--target-processes` CLI option.

## 1.7. Updates in 2020.1

- ▶ Initial release of the Compute Sanitizer (with CUDA 11.0)

Updates to the Sanitizer API :

- ▶ Added support for per-thread streams
- ▶ Added APIs to retrieve the PC and size of a CUDA function or patch
- ▶ Added callback for `cudaStreamAttachMemAsync`
- ▶ Added direction to `memcpy` callback data
- ▶ Added stream to `memcpy` and `memset` callbacks data
- ▶ Added launch callback after `syscall` setup
- ▶ Added visibility field to allocation callback data
- ▶ Added PC argument to block entry callback
- ▶ Added incoming value to memory access callbacks
- ▶ Added `threadCount` to barrier callbacks
- ▶ Added cooperative group flags for barrier and function callbacks

## 1.8. Updates in 2019.1

- ▶ Initial release of the Compute Sanitizer API (with CUDA 10.1)

## Chapter 2.

# KNOWN LIMITATIONS

- ▶ Applications run much slower under the Compute Sanitizer tools. This may cause some kernel launches to fail with a launch timeout error when running with the Compute Sanitizer enabled.
- ▶ Compute Sanitizer tools do not support device backtrace on Maxwell devices (SM 5.x).
- ▶ Compute Sanitizer tools do not support CUDA/Direct3D interop.
- ▶ Compute Sanitizer tools do not support CUDA/Vulkan interop.
- ▶ The memcheck tool does not support CUDA API error checking for API calls made on the GPU using dynamic parallelism.
- ▶ The racecheck, synccheck and initcheck tools do not support CUDA dynamic parallelism.
- ▶ CUDA dynamic parallelism is not supported when Windows Hardware-accelerated GPU scheduling is enabled.
- ▶ Compute Sanitizer tools do not support OptiX.
- ▶ Compute Sanitizer tools cannot interoperate with other CUDA developer tools. This includes CUDA coredumps which are automatically disabled by the Compute Sanitizer.
- ▶ Compute Sanitizer tools do not support IPC memory pools. Using it will result in false positives.
- ▶ The initcheck tool does not support **--track-unused-memory=yes** command line option on asynchronous allocations: unused memory will not be reported.

## Chapter 3.

# KNOWN ISSUES

- ▶ On SM 7.0 and above, the racecheck tool does not fully support warp synchronization instructions with a partial thread mask. If such an instruction is encountered, it is handled as if the mask would have been full (i.e., 0xffffffff). As a result, checking can be too conservative at times and some potential intra-warp hazards will not be detected.
- ▶ With some versions of Windows Server 2016, programs built with some configurations might hang when used with the Compute Sanitizer. A workaround for this issue is to use the Computer Sanitizer with **--show-backtrace device** or **--show-backtrace no** options.



# Chapter 4.

## SUPPORT

Information on supported platforms and GPUs.

### 4.1. Platform Support

Table 1 Platforms supported by Compute Sanitizer

| Platform            | Support |
|---------------------|---------|
| Windows             | Yes     |
| Linux (x86_64)      | Yes     |
| Linux (ppc64le)     | Yes     |
| Linux (aarch64sbsa) | Yes     |
| Linux (aarch64)     | No      |
| QNX                 | No      |
| MacOSX              | No      |

### 4.2. GPU Support

Table 2 GPU architectures supported by Compute Sanitizer

| Architecture | Support |
|--------------|---------|
| Kepler       | No      |
| Maxwell      | Yes     |
| Pascal       | Yes     |
| Volta        | Yes     |
| Turing       | Yes     |
| Ampere       | Yes     |

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