

# cupy740\_crash\_mre.py

May 8, 2020

```
[1]: # cupy 7.4.0 memory error MRE
```

```
[2]: import numpy as np
import cupy as cp

MB = 1024**2
cp.cuda.Device(3).use()

free, total = cp.cuda.Device(3).mem_info
print(f"MB free {free / MB :.0f} total {total / MB :.0f}")

# ok on these ...
# n, p, g = 250, 5, 10
# n, p, g = 2500, 25, 1000

# errors on these
n, p, g = 25000, 250, 10000

yg = np.random.rand(n, g).astype("float32")
X = np.random.rand(n, p).astype("float32")

ygd = cp.asarray(yg)
Xd = cp.asarray(X)
print(f"MB matrices: {(ygd.nbytes + Xd.nbytes) / MB :.0f}")
assert ygd.nbytes + Xd.nbytes < free

Qd, Rd = cp.linalg.qr(Xd)
bhatsd = cp.linalg.solve(Rd, Qd.T @ ygd)
yhatsd = Xd @ bhatsd
```

MB free 12027 total 12196

MB matrices: 978

```
[3]: ed = yhatsd - ygd
```

```

└─
↳ -----
CUDA Driver Error                                Traceback (most recent call
↳ last)

<ipython-input-3-ac5aaa8becf1> in <module>
----> 1 ed = yhat_sd - ygd

cupy/core/core.pyx in cupy.core.core.ndarray.__sub__()

cupy/core/_kernel.pyx in cupy.core._kernel.ufunc.__call__()

cupy/core/_kernel.pyx in cupy.core._kernel.ufunc._get_ufunc_kernel()

cupy/core/_kernel.pyx in cupy.core._kernel._get_ufunc_kernel()

cupy/core/_kernel.pyx in cupy.core._kernel.
↳ _get_simple_elementwise_kernel()

cupy/core/carray.pxi in cupy.core.core.compile_with_cache()

~/conda/envs/rapidsai/lib/python3.6/site-packages/cupy/cuda/compiler.py
↳ in compile_with_cache(source, options, arch, cache_dir, extra_source, backend)
    285     else:
    286         return _compile_with_cache_cuda(source, options, arch,
↳ cache_dir,
--> 287             extra_source, backend)
    288
    289

~/conda/envs/rapidsai/lib/python3.6/site-packages/cupy/cuda/compiler.py
↳ in _compile_with_cache_cuda(source, options, arch, cache_dir, extra_source,
↳ backend)
    333         cubin_hash = six.b(hashlib.md5(cubin).hexdigest())
    334         if hash == cubin_hash:
--> 335             mod.load(cubin)
    336             return mod
    337

```

```
cupy/cuda/function.pyx in cupy.cuda.function.Module.load()
```

```
cupy/cuda/function.pyx in cupy.cuda.function.Module.load()
```

```
cupy/cuda/driver.pyx in cupy.cuda.driver.moduleLoadData()
```

```
cupy/cuda/driver.pyx in cupy.cuda.driver.check_status()
```

```
CUDADriverError: CUDA_ERROR_ILLEGAL_ADDRESS: an illegal memory access  
↳ was encountered
```

```
[4]: cp.show_config()
```

```
CuPy Version      : 7.4.0  
CUDA Root        : /home/turbach/.conda/envs/rapidsai  
CUDA Build Version : 10020  
CUDA Driver Version : 10020  
CUDA Runtime Version : 10020  
cuBLAS Version    : 10202  
cuFFT Version     : 10102  
cuRAND Version    : 10102  
cuSOLVER Version  : (10, 3, 0)  
cuSPARSE Version  : CuSparseError('CUSPARSE_STATUS_NOT_INITIALIZED',)  
NVRTC Version     : (10, 2)  
cuDNN Build Version : 7605  
cuDNN Version     : 7605  
NCCL Build Version : 2406  
NCCL Runtime Version : 2507
```

```
[5]: %%bash
```

```
uname -m && cat /etc/*release  
nvidia-smi
```

```
x86_64  
CentOS Linux release 7.3.1611 (Core)  
NAME="CentOS Linux"  
VERSION="7 (Core)"  
ID="centos"  
ID_LIKE="rhel fedora"  
VERSION_ID="7"
```

```
PRETTY_NAME="CentOS Linux 7 (Core)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:centos:centos:7"
HOME_URL="https://www.centos.org/"
BUG_REPORT_URL="https://bugs.centos.org/"
```

```
CENTOS_MANTISBT_PROJECT="CentOS-7"
CENTOS_MANTISBT_PROJECT_VERSION="7"
REDHAT_SUPPORT_PRODUCT="centos"
REDHAT_SUPPORT_PRODUCT_VERSION="7"
```

```
CentOS Linux release 7.3.1611 (Core)
CentOS Linux release 7.3.1611 (Core)
Fri May 8 19:23:56 2020
```

```

+-----+
| NVIDIA-SMI 440.82          Driver Version: 440.82          CUDA Version: 10.2          |
+-----+-----+-----+-----+-----+-----+
| GPU  Name                Persistence-M| Bus-Id        Disp.A | Volatile Uncorr. ECC |
| Fan  Temp  Perf    Pwr:Usage/Cap|      Memory-Usage | GPU-Util  Compute M. |
+-----+-----+-----+-----+-----+-----+
|   0   TITAN X (Pascal)      Off   | 00000000:02:00:0  Off  |           N/A   |
| 23%   28C    P8     8W / 250W |  37MiB / 12196MiB |      0%   Default  |
+-----+-----+-----+-----+-----+-----+
|   1   TITAN X (Pascal)      Off   | 00000000:03:00:0  Off  |           N/A   |
| 23%   34C    P8     9W / 250W |  12MiB / 12196MiB |      0%   Default  |
+-----+-----+-----+-----+-----+-----+
|   2   TITAN X (Pascal)      Off   | 00000000:85:00:0  Off  |           N/A   |
| 23%   37C    P8    10W / 250W | 10991MiB / 12196MiB |      0%   Default  |
+-----+-----+-----+-----+-----+-----+
|   3   TITAN X (Pascal)      Off   | 00000000:86:00:0  Off  |           N/A   |
| 23%   43C    P2    54W / 250W |  3267MiB / 12196MiB |      0%   Default  |
+-----+-----+-----+-----+-----+-----+

```

```

+-----+
| Processes:                                     GPU Memory |
| GPU      PID    Type   Process name                               Usage      |
+-----+-----+-----+-----+-----+-----+
|   0      4774    G     /usr/bin/Xorg                               12MiB     |
|   0      4853    G     gnome-shell                                 12MiB     |
|   2     14106    C     /home/qiz001/.conda/envs/cupy/bin/python   2217MiB   |
|   2     31666    C     /home/qiz001/.conda/envs/cupy/bin/python   219MiB    |
|   2     31715    C     /home/qiz001/.conda/envs/cupy/bin/python   173MiB    |
|   3     14422    C     ...turbach/.conda/envs/rapidsai/bin/python 3253MiB   |
+-----+-----+-----+-----+-----+-----+

```

```
[6]: for key, val in cp.cuda.Device(3).attributes.items(): print(key, val)
```

```
AsyncEngineCount 2
```

CanFlushRemoteWrites 0  
CanMapHostMemory 1  
CanUseHostPointerForRegisteredMem 1  
ClockRate 1531000  
ComputeMode 0  
ComputePreemptionSupported 1  
ConcurrentKernels 1  
ConcurrentManagedAccess 1  
CooperativeLaunch 1  
CooperativeMultiDeviceLaunch 1  
DirectManagedMemAccessFromHost 0  
EccEnabled 0  
GlobalL1CacheSupported 1  
GlobalMemoryBusWidth 384  
GpuOverlap 1  
HostNativeAtomicSupported 0  
HostRegisterSupported 1  
Integrated 0  
IsMultiGpuBoard 0  
KernelExecTimeout 0  
L2CacheSize 3145728  
LocalL1CacheSupported 1  
ManagedMemory 1  
MaxBlockDimX 1024  
MaxBlockDimY 1024  
MaxBlockDimZ 64  
MaxGridDimX 2147483647  
MaxGridDimY 65535  
MaxGridDimZ 65535  
MaxPitch 2147483647  
MaxRegistersPerBlock 65536  
MaxRegistersPerMultiprocessor 65536  
MaxSharedMemoryPerBlock 49152  
MaxSharedMemoryPerBlockOptin 49152  
MaxSharedMemoryPerMultiprocessor 98304  
MaxSurface1DLayeredLayers 2048  
MaxSurface1DLayeredWidth 32768  
MaxSurface1DWidth 32768  
MaxSurface2DHeight 65536  
MaxSurface2DLayeredHeight 32768  
MaxSurface2DLayeredLayers 2048  
MaxSurface2DLayeredWidth 32768  
MaxSurface2DWidth 131072  
MaxSurface3DDepth 16384  
MaxSurface3DHeight 16384  
MaxSurface3DWidth 16384  
MaxSurfaceCubemapLayeredLayers 2046  
MaxSurfaceCubemapLayeredWidth 32768

MaxSurfaceCubemapWidth 32768  
MaxTexture1DLayeredLayers 2048  
MaxTexture1DLayeredWidth 32768  
MaxTexture1DLinearWidth 268435456  
MaxTexture1DMipmappedWidth 16384  
MaxTexture1DWidth 131072  
MaxTexture2DGatherHeight 32768  
MaxTexture2DGatherWidth 32768  
MaxTexture2DHeight 65536  
MaxTexture2DLayeredHeight 32768  
MaxTexture2DLayeredLayers 2048  
MaxTexture2DLayeredWidth 32768  
MaxTexture2DLinearHeight 65000  
MaxTexture2DLinearPitch 2097120  
MaxTexture2DLinearWidth 131072  
MaxTexture2DMipmappedHeight 32768  
MaxTexture2DMipmappedWidth 32768  
MaxTexture2DWidth 131072  
MaxTexture3DDepth 16384  
MaxTexture3DDepthAlt 32768  
MaxTexture3DHeight 16384  
MaxTexture3DHeightAlt 8192  
MaxTexture3DWidth 16384  
MaxTexture3DWidthAlt 8192  
MaxTextureCubemapLayeredLayers 2046  
MaxTextureCubemapLayeredWidth 32768  
MaxTextureCubemapWidth 32768  
MaxThreadsPerBlock 1024  
MaxThreadsPerMultiProcessor 2048  
MemoryClockRate 5005000  
MultiGpuBoardGroupID 3  
MultiProcessorCount 28  
PageableMemoryAccess 0  
PageableMemoryAccessUsesHostPageTables 0  
PciBusId 134  
PciDeviceId 0  
PciDomainId 0  
Reserved92 0  
Reserved93 0  
Reserved94 0  
SingleToDoublePrecisionPerfRatio 32  
StreamPrioritiesSupported 1  
SurfaceAlignment 512  
TccDriver 0  
TextureAlignment 512  
TexturePitchAlignment 32  
TotalConstantMemory 65536  
UnifiedAddressing 1

WarpSize 32

[ ]: