Heap overflow in mp4info, ReadPartial, Ap4StdCFileByteStream.cpp:341 #812

⊙ Open 5hadowblad3 opened this issue 15 days ago · 0 comments

5hadowblad3 commented 15 days ago • edited

Hi, there.

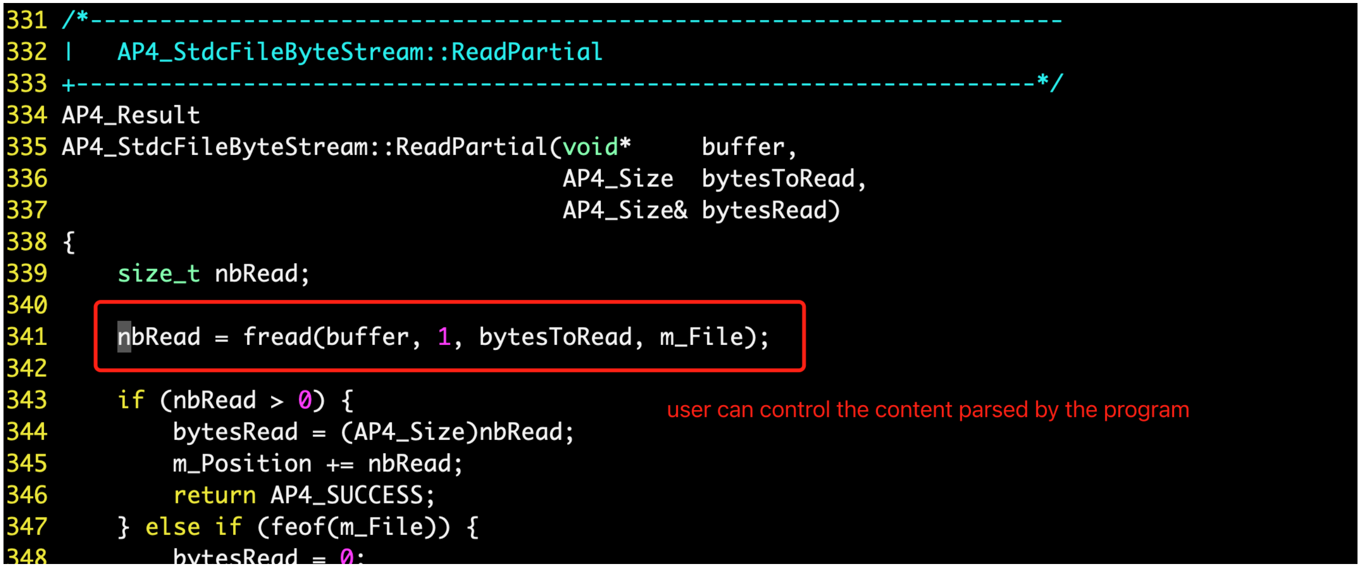
There is an heap overflow in ReadPartial, Ap4StdCFileByteStream.cpp:341, in the newest master branch `5e7bb34` , which seems to be incomplete fix of issue #510.

Here is the reproducing command:

```
mp42info poc
```

POC:
mp4info_overflow_ReadPartial341.zip
(unzip first)

The reason of this overflow can causes arbitrary code execution by memory manipulation since user can control the content parsed by the program.



```
331 /*----------------------------------------------------------------------
332 |   AP4_StdcFileByteStream::ReadPartial
333 +---------------------------------------------------------------------*/
334 AP4_Result
335 AP4_StdcFileByteStream::ReadPartial(void*     buffer,
336                                     AP4_Size  bytesToRead,
337                                     AP4_Size& bytesRead)
338 {
339     size_t nbRead;
340
341     nbRead = fread(buffer, 1, bytesToRead, m_File);
342
343     if (nbRead > 0) {
344         bytesRead = (AP4_Size)nbRead;
345         m_Position += nbRead;
346         return AP4_SUCCESS;
347     } else if (feof(m_File)) {
348         bytesRead = 0;
```

user can control the content parsed by the program

Here is the reproduce trace reported by ASAN:

```
==1448318==ERROR: AddressSanitizer: heap-buffer-overflow on address 0x602000000171 at pc 0x000000471d71 bp 0x7ffd4dd08e80 sp 0x7ffd4dd08630
 WRITE of size 30 at 0x602000000171 thread T0
     #0 0x471d70 in __interceptor_fread.part.0 /dependence/llvm11/llvm-11.0.0.src/projects/compiler-rt/lib/asan/../sanitizer_common/sanitizer_common_interceptors.inc:1027:16
     #1 0x66f795 in AP4_StdcFileByteStream::ReadPartial(void*, unsigned int, unsigned int&) /benchmark/Bento4/Source/C++/System/StdC/Ap4StdCFileByteStream.cpp:341:14
     #2 0x549ce9 in AP4_ByteStream::Read(void*, unsigned int) /benchmark/Bento4/Source/C++/Core/Ap4ByteStream.cpp:54:29
     #3 0x6601bb in AP4_MetaDataStringAtom::AP4_MetaDataStringAtom(unsigned int, unsigned int, AP4_ByteStream&) /benchmark/Bento4/Source/C++/MetaData/Ap4MetaData.cpp:1637:12
     #4 0x6601bb in AP4_MetaDataAtomTypeHandler::CreateAtom(unsigned int, unsigned int, AP4_ByteStream&, unsigned int, AP4_Atom*&) /benchmark/Bento4/Source/C++/MetaData/Ap4MetaData.cpp:428:24
     #5 0x53d50b in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:844:21
     #6 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #7 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #8 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
     #9 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
     #10 0x660634 in AP4_MetaDataAtomTypeHandler::CreateAtom(unsigned int, unsigned int, AP4_ByteStream&, unsigned int, AP4_Atom*&) /benchmark/Bento4/Source/C++/MetaData/Ap4MetaData.cpp:419:20
     #11 0x53d50b in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:844:21
     #12 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #13 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #14 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
     #15 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
     #16 0x53def3 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:816:20
     #17 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #18 0x55389e in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #19 0x552c6e in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool, unsigned char, unsigned int, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:154:5
     #20 0x552c6e in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:86:20
     #21 0x53dd0d in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:830:20
     #22 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
```

```
    #23 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
    #24 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
    #25 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
    #26 0x53def3 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:816:20
    #27 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
    #28 0x5746a6 in AP4_DrefAtom::AP4_DrefAtom(unsigned int, unsigned char, unsigned int, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4DrefAtom.cpp:84:16
    #29 0x573f60 in AP4_DrefAtom::Create(unsigned int, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4DrefAtom.cpp:50:16
    #30 0x53ed78 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:580:20
    #31 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
    #32 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
    #33 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
    #34 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
    #35 0x53def3 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:816:20
    #36 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
    #37 0x53b237 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:154:12
    #38 0x579c4b in AP4_File::ParseStream(AP4_ByteStream&, AP4_AtomFactory&, bool) /benchmark/Bento4/Source/C++/Core/Ap4File.cpp:104:12
    #39 0x57a2ff in AP4_File::AP4_File(AP4_ByteStream&, bool) /benchmark/Bento4/Source/C++/Core/Ap4File.cpp:78:5
    #40 0x4fb236 in main /benchmark/Bento4/Source/C++/Apps/Mp4Info/Mp4Info.cpp:1852:26
    #41 0x7f2c774ff082 in __libc_start_main /build/glibc-SzIz7B/glibc-2.31/csu/../csu/libc-start.c:308:16
    #42 0x41d89d in _start (/benchmark/Bento4/build-a/mp4info+0x41d89d)

 0x602000000171 is located 0 bytes to the right of 1-byte region [0x602000000170,0x602000000171)
 allocated by thread T0 here:
    #0 0x4f7fc7 in operator new[](unsigned long) /dependence/llvm11/llvm-11.0.0.src/projects/compiler-rt/lib/asan/asan_new_delete.cpp:102:3
    #1 0x60b04d in AP4_String::AP4_String(unsigned int) /benchmark/Bento4/Source/C++/Core/Ap4String.cpp:85:15
    #2 0x53d50b in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:844:21
    #3 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
    #4 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
    #5 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
    #6 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool, AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
    #7 0x660634 in AP4_MetaDataAtomTypeHandler::CreateAtom(unsigned int, unsigned int,
AP4_ByteStream&, unsigned int, AP4_Atom*&)
/benchmark/Bento4/Source/C++/MetaData/Ap4MetaData.cpp:419:20
     #8 0x53d50b in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned
int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:844:21
     #9 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&,
AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #10 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned
long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #11 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
     #12 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
     #13 0x53def3 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned
int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:816:20
     #14 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&,
AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #15 0x55389e in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned
long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #16 0x552c6e in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool,
unsigned char, unsigned int, AP4_ByteStream&, AP4_AtomFactory&)
/benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:154:5
     #17 0x552c6e in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:86:20
     #18 0x53dd0d in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned
int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:830:20
     #19 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&,
AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #20 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned
long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #21 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
     #22 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
     #23 0x53def3 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned
int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:816:20
     #24 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&,
AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #25 0x5746a6 in AP4_DrefAtom::AP4_DrefAtom(unsigned int, unsigned char, unsigned int,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4DrefAtom.cpp:84:16
     #26 0x573f60 in AP4_DrefAtom::Create(unsigned int, AP4_ByteStream&, AP4_AtomFactory&)
/benchmark/Bento4/Source/C++/Core/Ap4DrefAtom.cpp:50:16
     #27 0x53ed78 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned
int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:580:20
     #28 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&,
AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #29 0x553677 in AP4_ContainerAtom::ReadChildren(AP4_AtomFactory&, AP4_ByteStream&, unsigned
long long) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:194:12
     #30 0x5529a3 in AP4_ContainerAtom::AP4_ContainerAtom(unsigned int, unsigned long long, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:139:5
     #31 0x5529a3 in AP4_ContainerAtom::Create(unsigned int, unsigned long long, bool, bool,
AP4_ByteStream&, AP4_AtomFactory&) /benchmark/Bento4/Source/C++/Core/Ap4ContainerAtom.cpp:88:20
     #32 0x53def3 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned int, unsigned
int, unsigned long long, AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:816:20
     #33 0x53bbf1 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, unsigned long long&,
AP4_Atom*&) /benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:234:14
     #34 0x53b237 in AP4_AtomFactory::CreateAtomFromStream(AP4_ByteStream&, AP4_Atom*&)
```

```
/benchmark/Bento4/Source/C++/Core/Ap4AtomFactory.cpp:154:12

 SUMMARY: AddressSanitizer: heap-buffer-overflow /dependence/llvm11/llvm-
11.0.0.src/projects/compiler-
rt/lib/asan/../sanitizer_common/sanitizer_common_interceptors.inc:1027:16 in
__interceptor_fread.part.0
 Shadow bytes around the buggy address:
   0x0c047fff7fd0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   0x0c047fff7fe0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   0x0c047fff7ff0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
   0x0c047fff8000: fa fa 00 00 fa fa 00 00 fa fa 00 00 fa fa 00 00
   0x0c047fff8010: fa fa 00 fa fa fa fd fa fa fa fd fa fa fa 01 fa
 =>0x0c047fff8020: fa fa fd fa fa fa fd fa fa fa 01 fa fa fa[01]fa
   0x0c047fff8030: fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa
   0x0c047fff8040: fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa
   0x0c047fff8050: fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa
   0x0c047fff8060: fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa
   0x0c047fff8070: fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa fa
 Shadow byte legend (one shadow byte represents 8 application bytes):
   Addressable:           00
   Partially addressable: 01 02 03 04 05 06 07
   Heap left redzone:       fa
   Freed heap region:       fd
   Stack left redzone:      f1
   Stack mid redzone:       f2
   Stack right redzone:     f3
   Stack after return:      f5
   Stack use after scope:   f8
   Global redzone:          f9
   Global init order:       f6
   Poisoned by user:        f7
   Container overflow:      fc
   Array cookie:            ac
   Intra object redzone:    bb
   ASan internal:           fe
   Left alloca redzone:     ca
   Right alloca redzone:    cb
   Shadow gap:              cc
 ==1448318==ABORTING
```

Assignees

No one assigned

Labels

None yet

Projects

None yet

Milestone

No milestone

Development

No branches or pull requests

1 participant