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Subject: An idea for heap-checking stuffs

Posted by [mdelfede](#) on Sun, 04 May 2008 10:06:24 GMT

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After last bug (still unresolved) of memory corruption on upp compiled under ubuntu hardy, I was thinking about some heap checking stuffs that IMO could be incorporated in upp.

So, the idea (I don't know if somebody already did it!) :

1) Set up a new building flag, for example HEAPCHECK.

2) when code is compiled with HEAPCHECK, do the following:

3) On each dynamic allocation, reserve some more bytes, some before and some after returned pointer, and fill with known data.

For example, if I need 10 bytes, I could reserve 20, like this :

```
DDDDDDAAAAAAAAAADDDDDD
```

```
  |  
returned pointer here
```

DDDDDD represent the 'spare' allocated bytes, filled with known values.

4) Keep a linked list not only for freed data but also for allocated data. I know that this can slow down much the code, but.... it's just when needed for debugging.

5) create 2 functions, FreeCheck() and UsedCheck() that scans the free and used allocated space and checks for values on DDDDD files.

6) allow the ability to switch on/off the heap checking on each allocation/free of memory. That one would slow down much the code, but would also allow to find corruptions just a little after they happens.

Up to here, not much work in upp code, IMHO.

The best would also be to add

7) Add container's methods entry/exit pointer checking. So, for each method called for a container, check container's pointers on method entry and exit. That one would catch 99% of pointer misuse as soon as it happens. Of course, that last one would mean to add a lot of (conditional) code to upp core.

Ciao

Max

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Subject: Re: An idea for heap-checking stuffs

Posted by [mirek](#) on Sun, 04 May 2008 16:23:56 GMT

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Good idea to activate heap checks in release mode.

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For example, if I need 10 bytes, I could reserve 20, like this :

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DDDDDD represent the 'spare' allocated bytes, filled with known values.

This is already done (in debug mode).

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Yep, this is also done BTW, I am using these links as sentinels. And it is also used to check leaks.

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MemoryCheck.

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Each allocation has serial number. You can set breakpoint to this serial number to catch the very allocation that gets corrupted later.

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Indeed. Only MEMORYCHECK in release.

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That is a good idea. A lot of code involved thought ("each method"

Mirek

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Subject: Re: An idea for heap-checking stuffs

Posted by [mdelfede](#) on Sun, 04 May 2008 16:45:08 GMT

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luzr wrote on Sun, 04 May 2008 18:23mdelfede wrote on Sun, 04 May 2008 06:06After last bug (still unresolved) of memory corruption on upp compiled under ubuntu hardy, I was thinking about some heap checking stuffs that IMO could be incorporated in upp.  
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Does it check also allocated blocks integrity ?

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That's very interesting... but how do you see the serial number and how do you set breakpoint ?

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code to upp core.

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Mirek

yep, but that could be done slowly... I could help for some classes. No hurry on that one

Max

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Subject: Re: An idea for heap-checking stuffs  
Posted by [mirek](#) on Sun, 04 May 2008 18:13:46 GMT  
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mdelfede wrote on Sun, 04 May 2008 12:45luzr wrote on Sun, 04 May 2008 18:23mdelfede wrote on Sun, 04 May 2008 06:06After last bug (still unresolved) of memory corruption on upp compiled under ubuntu hardy, I was thinking about some heap checking stuffs that IMO could be incorporated in upp.

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Sorry, it is in fact "MemoryCheckDebug". It calls basic MemoryCheck and then goes through the list.

Quote:

That's very interesting... but how do you see the serial number and how do you set breakpoint ?

You should see breakpoint serial number in the .log.

You can set it using "MemoryBreakpoint" function or using --memory\_breakpoint commandline option. However, this is not very helpful in our Ubuntu problem as both can get active only Applnit...

Mirek

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