Heap Massage

- Traditional exploitation has become tougher
- On Linux... who knows how to do it?
- On Windows
  - XP SP2 made it tougher
    - Lookaside overwrites
    - Last chunk overwrite
  - Vista anybody?

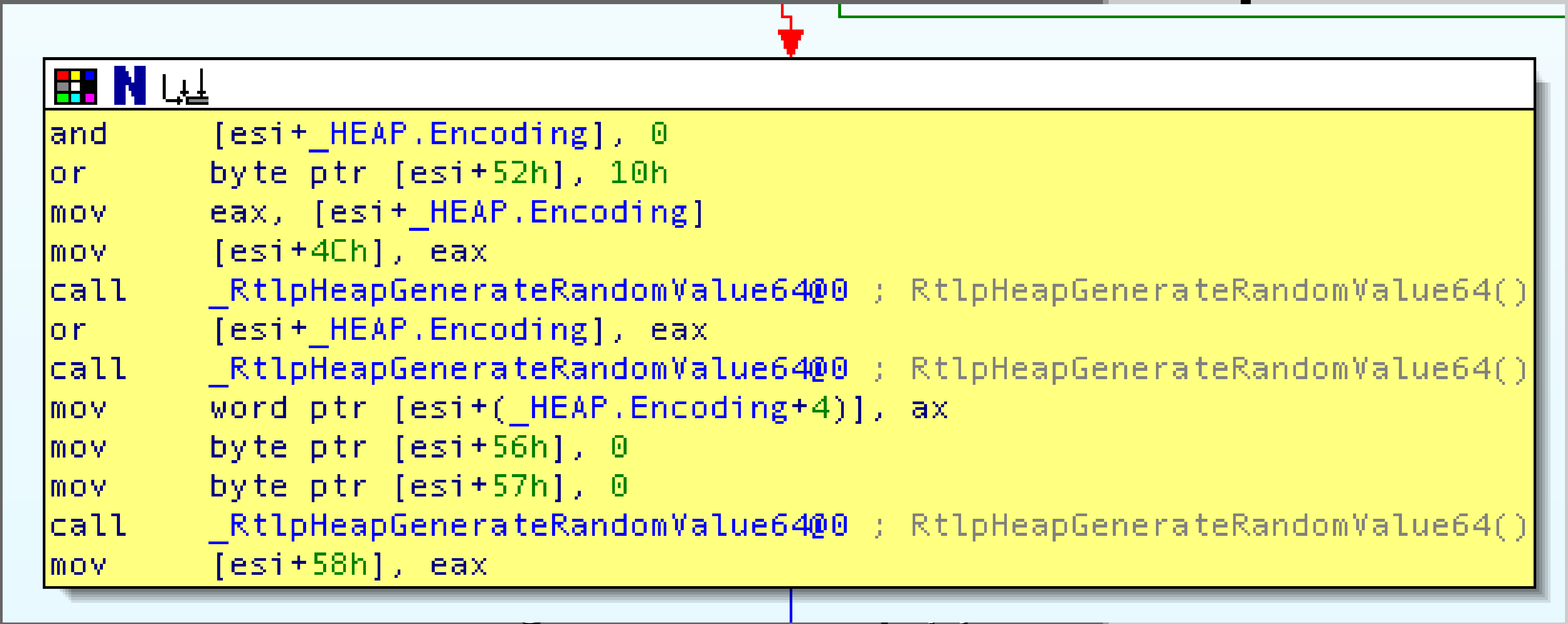
Heap Exploitation

* Vista:

  * Lookaside lists are gone...

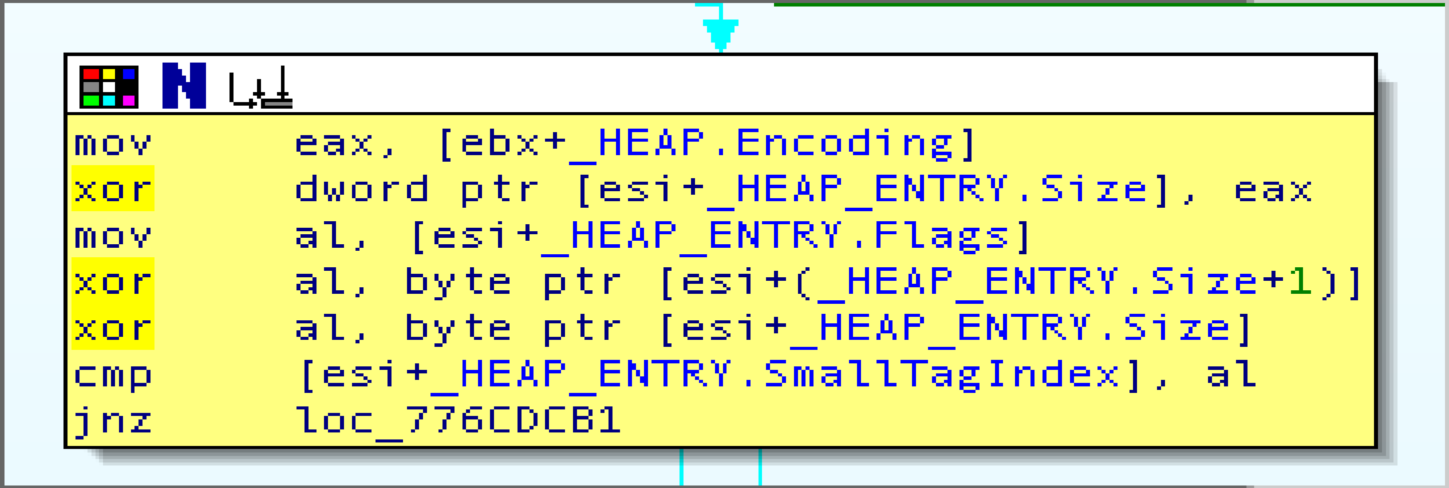
  * Welcome Low Fragmentation Heap (?)

  * ... and more security checks.



```
and     [esi+_HEAP.Encoding], 0
or      byte ptr [esi+52h], 10h
mov     eax, [esi+_HEAP.Encoding]
mov     [esi+4Ch], eax
call    _RtlpHeapGenerateRandomValue64@0 ; RtlpHeapGenerateRandomValue64()
or      [esi+_HEAP.Encoding], eax
call    _RtlpHeapGenerateRandomValue64@0 ; RtlpHeapGenerateRandomValue64()
mov     word ptr [esi+(_HEAP.Encoding+4)], ax
mov     byte ptr [esi+56h], 0
mov     byte ptr [esi+57h], 0
call    _RtlpHeapGenerateRandomValue64@0 ; RtlpHeapGenerateRandomValue64()
mov     [esi+58h], eax
```

* ...



```
mov     eax, [ebx+_HEAP.Encoding]
xor     dword ptr [esi+_HEAP_ENTRY.Size], eax
mov     al, [esi+_HEAP_ENTRY.Flags]
xor     al, byte ptr [esi+(_HEAP_ENTRY.Size+1)]
xor     al, byte ptr [esi+_HEAP_ENTRY.Size]
cmp     [esi+_HEAP_ENTRY.SmallTagIndex], al
jnz     loc_776CDCB1
```

Heap Exploitation

- So... are heap exploits gone?
- No way! we love them! help them stay!

* So lets go back to basics...

What's after the vulnerable buffer, which if corrupted, will let an attacker gain code execution?

anybody?

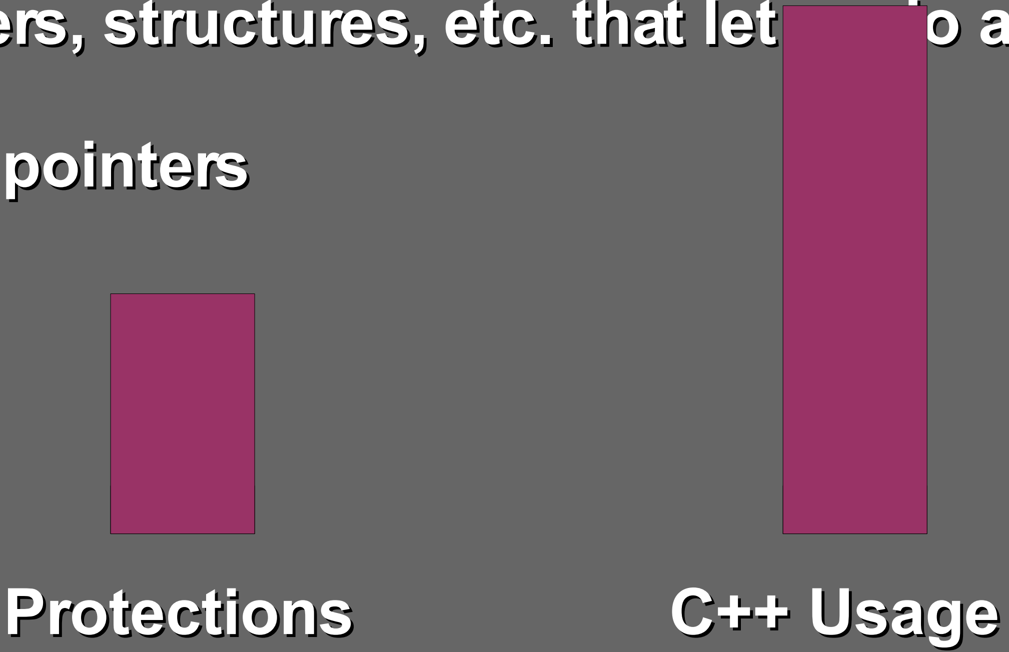
Heap Massaging

* Code

* Sensitive information

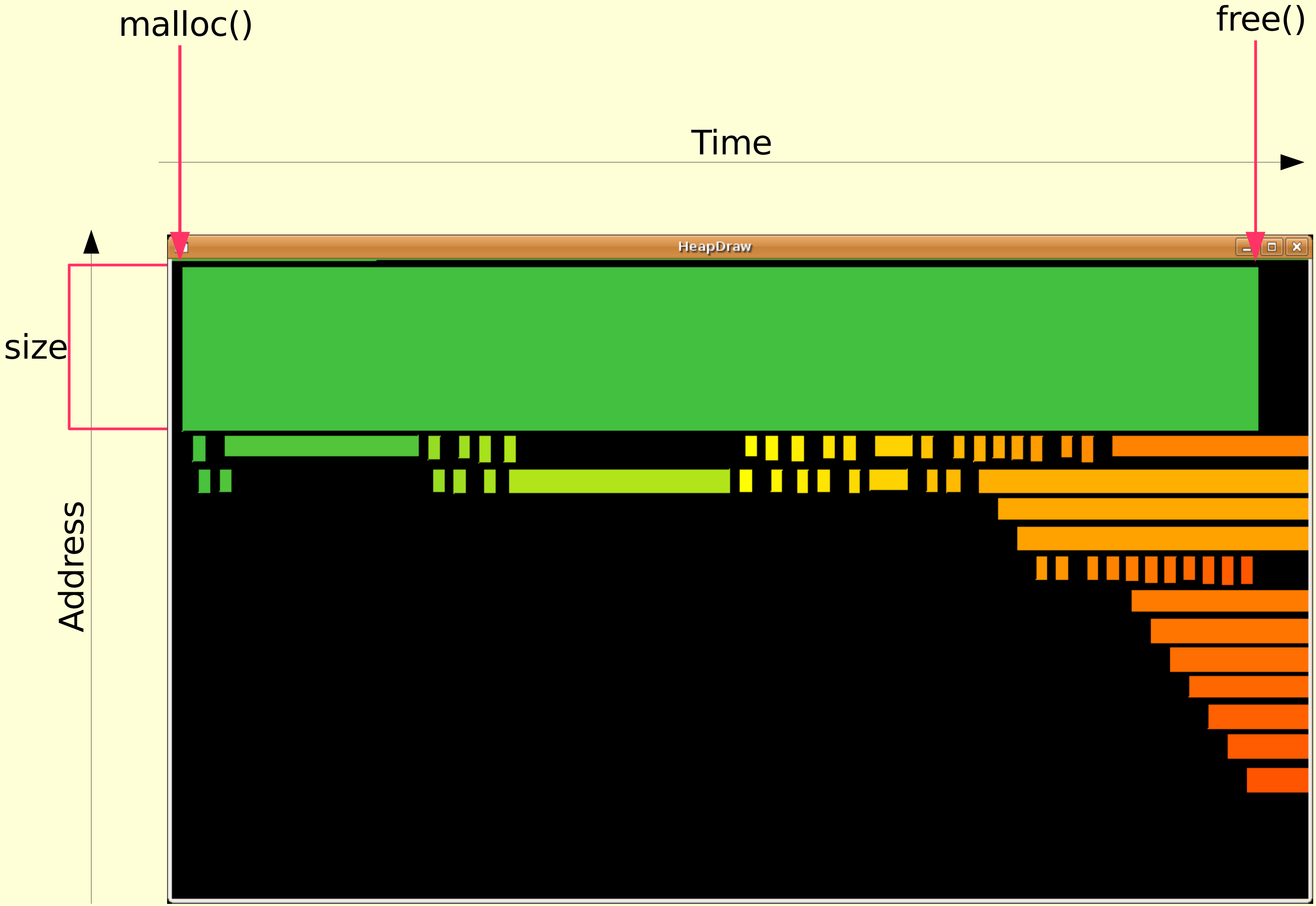
* Pointers, structures, etc. that let o a 4bw

* Class pointers



Heap Massaging

- Heap block ordering is vital.
- We can't leave it to fate.
- Need to take control of the order of blocks.
  - Learn more of the application.
  - Find other commands that you can use.
  - Find memory leaks.
  - Ideally, build remote malloc(), free(), etc.



Limits: 1.082366-1.125270 0x0004ee1f-0x0004f327 (1288)

Heap Massaging

* google for “Heap Feng Shui” (Alex Sotirov)

* HeapDraw/HeapTracer and a few more tools

http://oss.coresecurity.com