

Programmers and segmentation in operating systems

Asked 10 years ago Modified 10 years ago Viewed 470 times



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I'm learning that segmentation in operating systems is based on dividing different segments (for a program, these could represent a symbol table, the source text, the stack...) into units that start at logical memory address 0. This is the virtual address that the MMU (?) uses to get the real in addition to the offset.

An apparent benefit of segmentation is that, since each segment starts at address 0, multiple processes can take advantage of a single segment simultaneously (an example is the shared library).

However, I don't see how else segmentation can benefit programmers. What would be some examples?

Thanks!

operating-system

virtual-memory

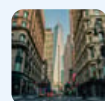
memory-segmentation

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asked Nov 29, 2014 at 21:20




[aralar](#)

3,120 ● 7 ● 32 ● 45

Python programmers and even C++ programmers don't care about segmentation. It is something between the language compiler and the OS. Some Assembly language programmers care and OS kernel developers must be aware of it. Segmentation is hardware feature. What is the hidden "usefulness" in your question? – xmojmr Nov 30, 2014 at 6:47

Honestly, I'm not sure. I was reading about it and one of the listed benefits, in addition to added simplicity for the compiler, was that it's easier for programmers to take advantage of it... Though I couldn't think of any but possibly those who use Assembly needing to e.g. know the location of the logical address of the third local variable in a function. Anyway, thanks for your help! – aralar Nov 30, 2014 at 7:40

- 1 See [Stack Overflow: What is the advantage of using segment registers \(today\)?](#) – xmojmr Nov 30, 2014 at 8:35 
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1 Answer

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2



Segmentation provides NO benefit to programmers. Segmentation is a kludge that developed to overcome architectural limits. The 16-bit PDP-11 computers could only address 64K of memory. The use of a segmentation allowed the programmer to map memory in and out of the address space to access more memory.



The 8086 chip was retrograde. IBM set the computer industry back by years using it for the PC rather than 68000. The 8086 used segments to reduce the size of instructions. Rather than using 32-bits for an address, instructions could use an offset from a segment register.

In 64-bit mode, the abomination of segments in the Intel processors finally goes away.

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answered Nov 30, 2014 at 16:22

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21.5k ● 3 ● 28 ● 65

Thank you! And why do you think segments are an abomination? Are they not present in 64-bit machines today, along with multilevel paging? – [aralar](#) Nov 30, 2014 at 16:30

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- 1 Segments are overly complicated and completely unnecessary with 32-bit and 64-bit machines. There is nothing that segments add over paging. Segments are not present in 64-bit Intel. – [user3344003](#) Nov 30, 2014 at 16:51
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