Load-Time Relocation
Process Virtual Address Space

- Base & Bounds Example
- SP
- Process
- Virtual
- Address
- Space
- RETURN
- ...
- ...
- ...
- CALL 140
x86-64 Address Translation

64-bit Virtual Address

| 16 | 9 | 9 | 9 | 9 | 12 |

PML4 (Page Directory Pointer Table)

PML3 (Page Directory)

PML2 (Page Table)

PML1 (Page Table)

Page Frame

Offset

52-bit Physical Address
Accessing User Memory

write(fd, buffer, length)

Pages

User Address Space (Virtual)

OS Address Space (Physical)
OS and User in Same Address Space

- Code
- Data
- Stack
- Operating System

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