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  - while (i <= max) ...
  - for (i = 0; i <= max; i++) ...

The stack and related registers

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- %ebp (Frame Pointer)

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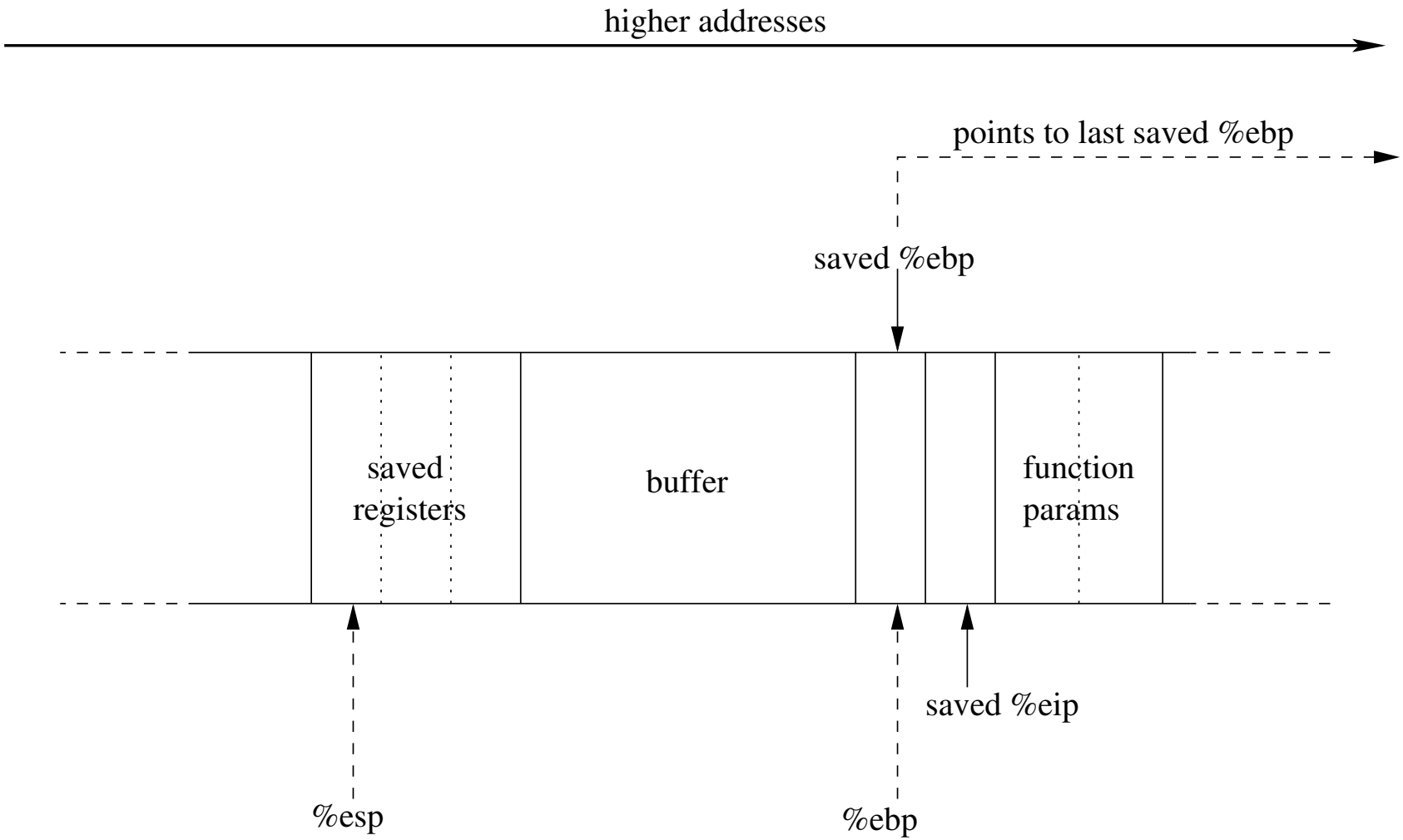

Overflow

- Little Endian Architecture

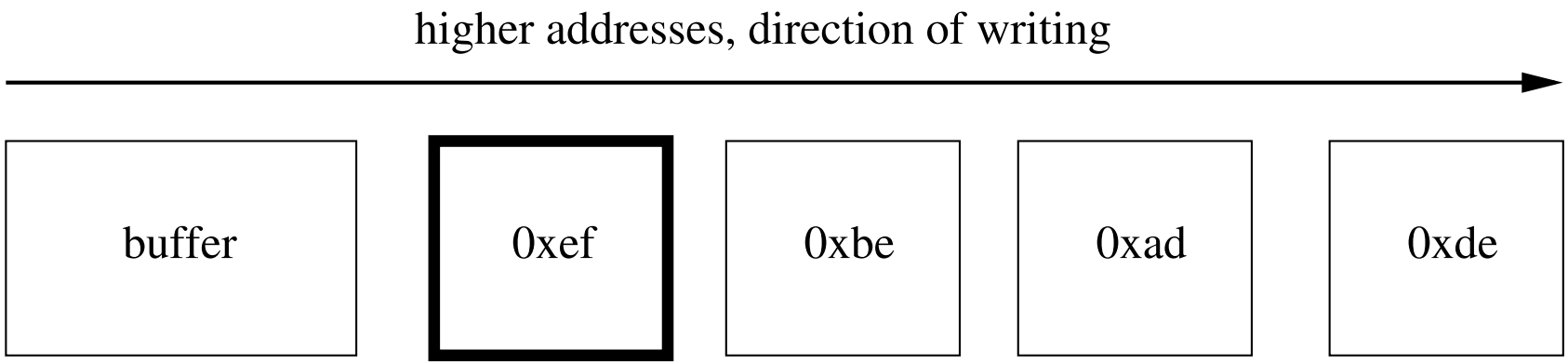

Figure: %ebp overwrite in detail

Push and Pop

- Putting data on the stack, and getting it back

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- Uses stack pointer %esp for operations
- Push decrements %esp by 4 and stores value where %esp points to
- Pop fetches value from where %esp points to and increments %esp then by 4

Leave

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  - mov esp, ebp (%esp is set to %ebp)

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  - mov esp, ebp (%esp is set to %ebp)
  - pop ebp (ebp is set to the saved ebp (!))

Ret

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  - pop eip (eip is fetched from where esp points to (!))

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- Ret (old %eip popped from stack) → Not harmful

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- Leave Step 1 (%esp set to %ebp) → Not harmful
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  - **Current** %esp partly controlled by us
- Leave Step 2 (old %ebp popped back to %ebp)
- Ret (old %eip popped from stack)
  - We partly control where %eip is popped from