Update on Ara

26/05/2021

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Ongoing work

- **Benchmarks + Verification**
  - Jacobi2d now works
  - Fixed:
    - Misaligned stores
    - Misc bugs
  - Added:
    - Strided memory operations
  - New riscv-tests
    - Misaligned mem ops
    - Strided mem ops
    - vsetivli (config)

- **TO**

Aligned stores

Support for aligned stores

- `vuint64m1_t ara_vec = {0xb4092d9a981142fa, 0xd7548e553400af32,`
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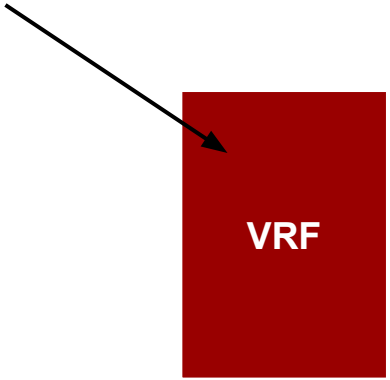

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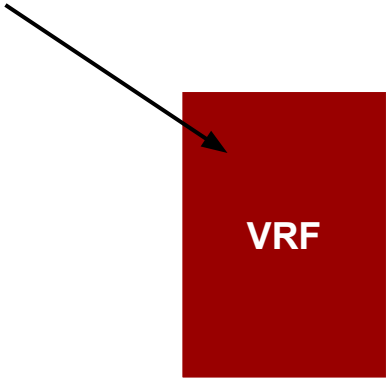

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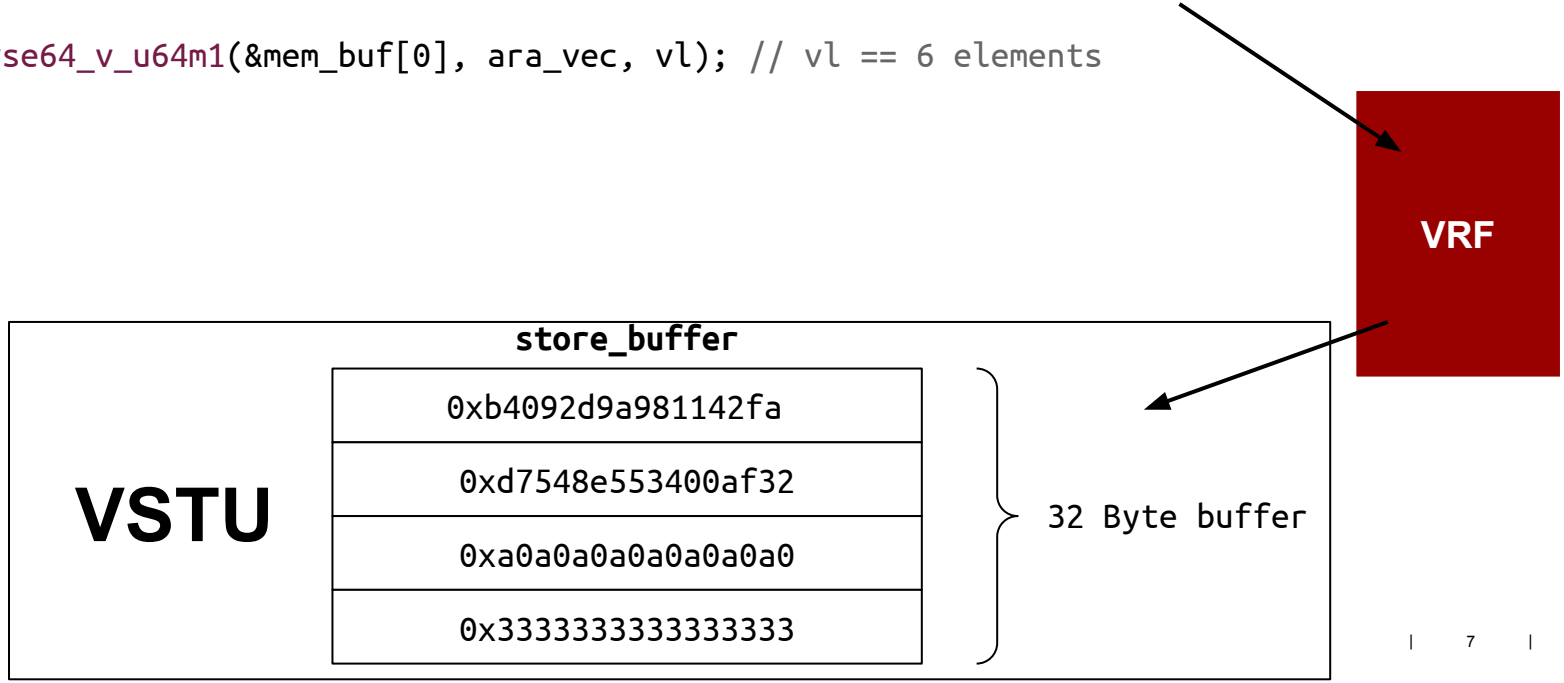

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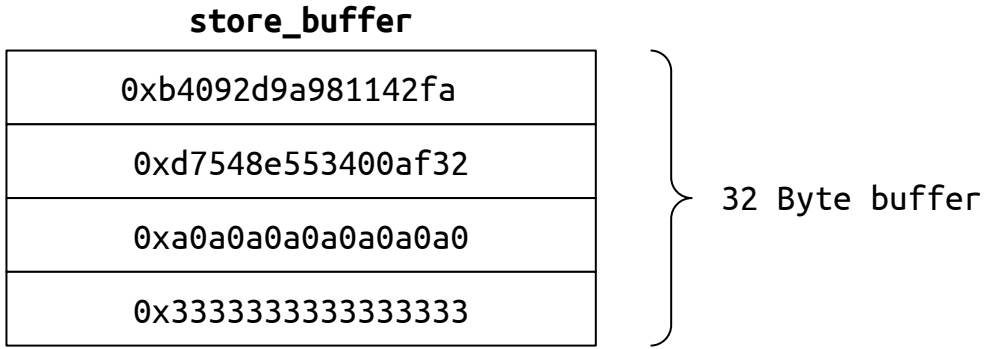

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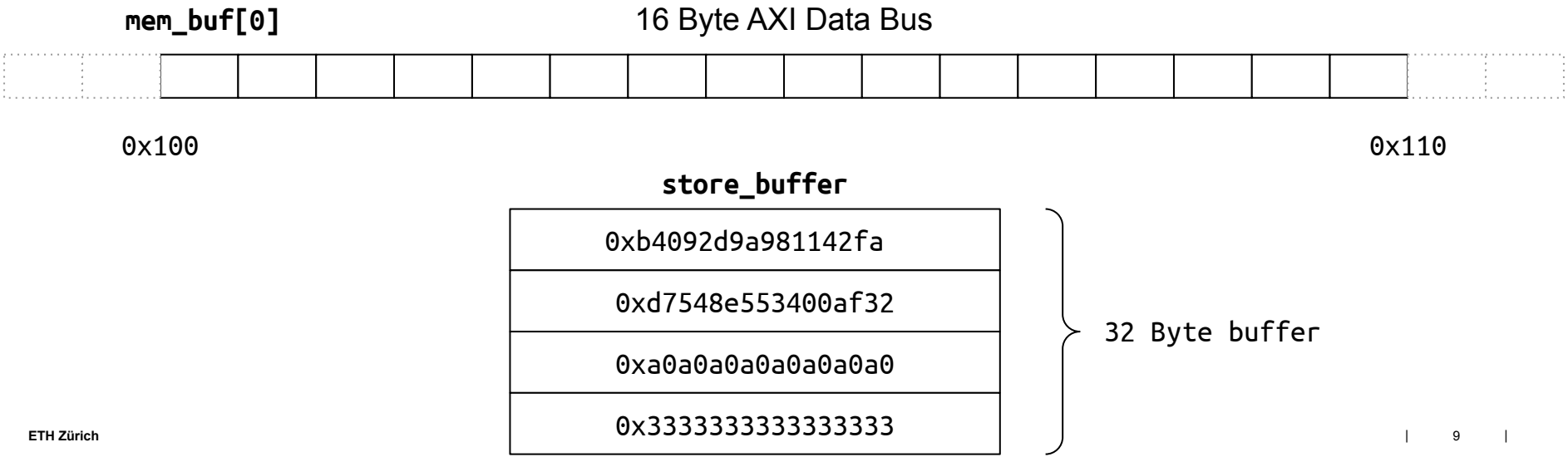

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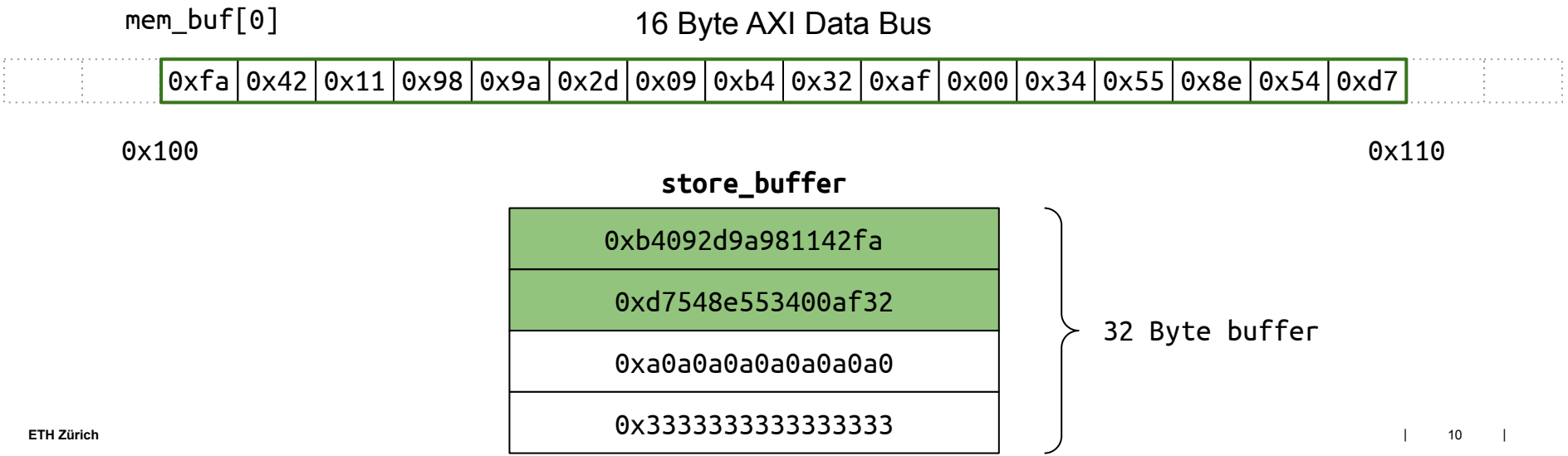

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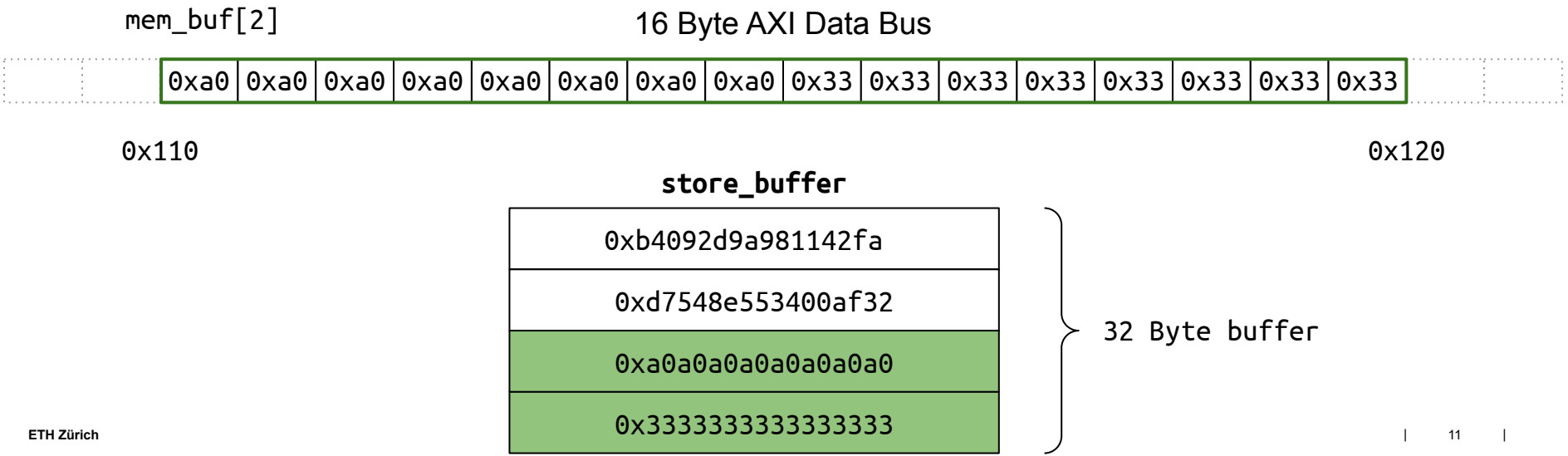

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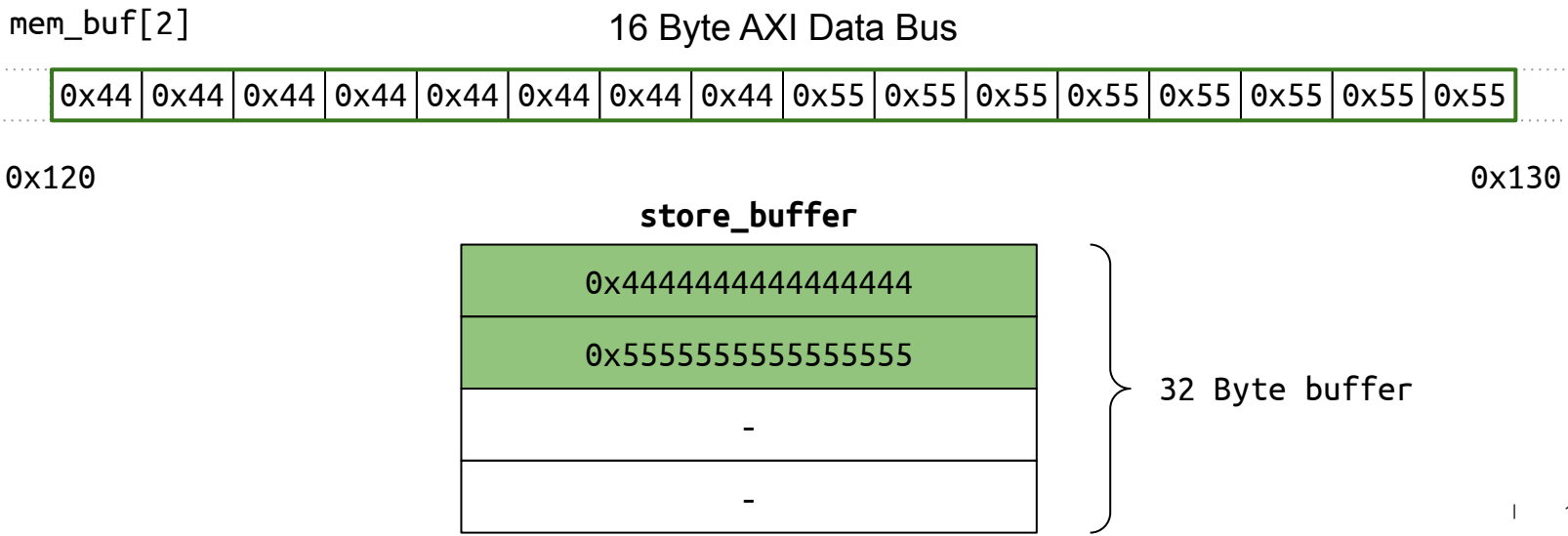

Misaligned stores

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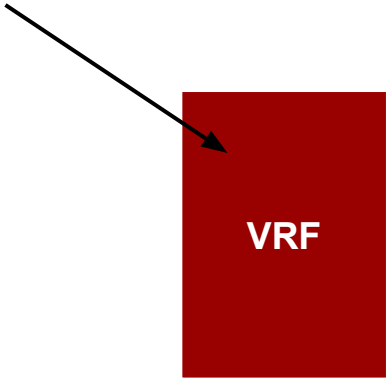

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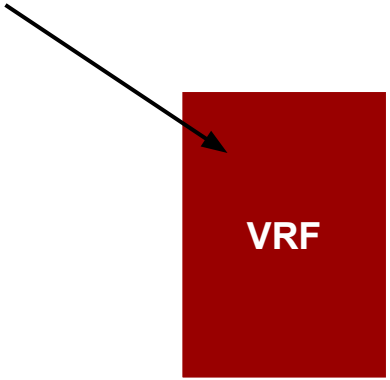

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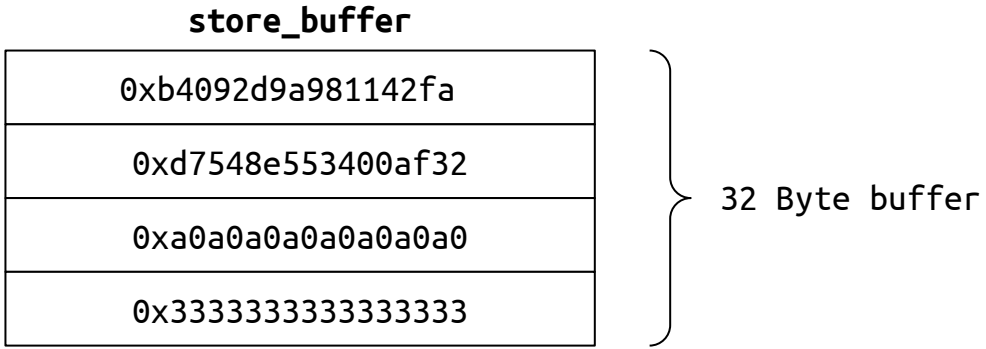

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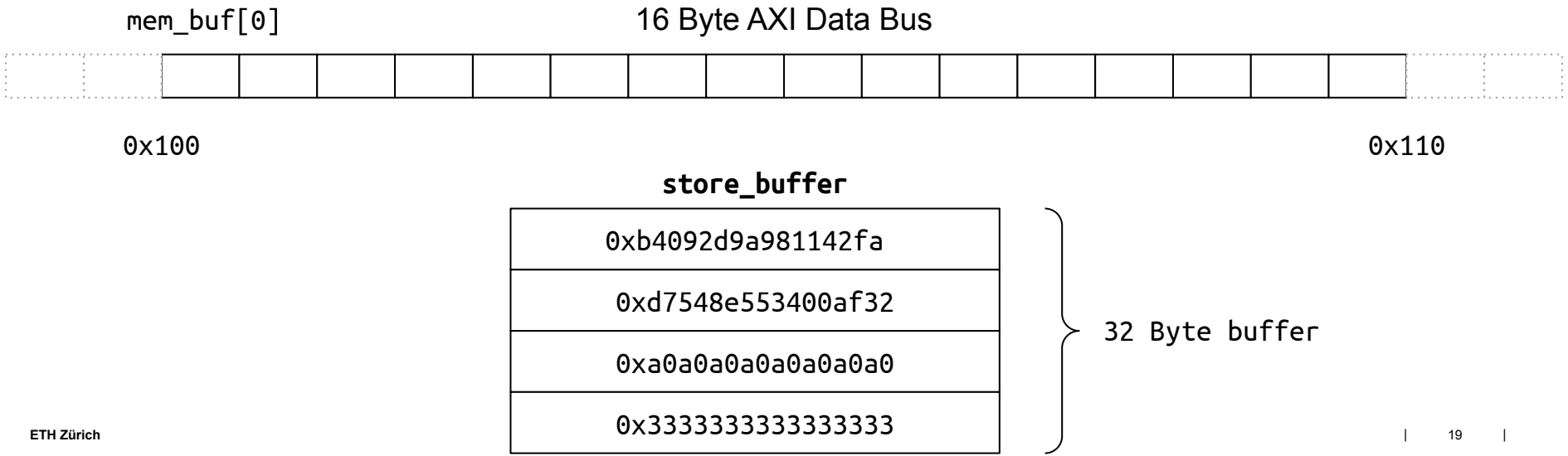

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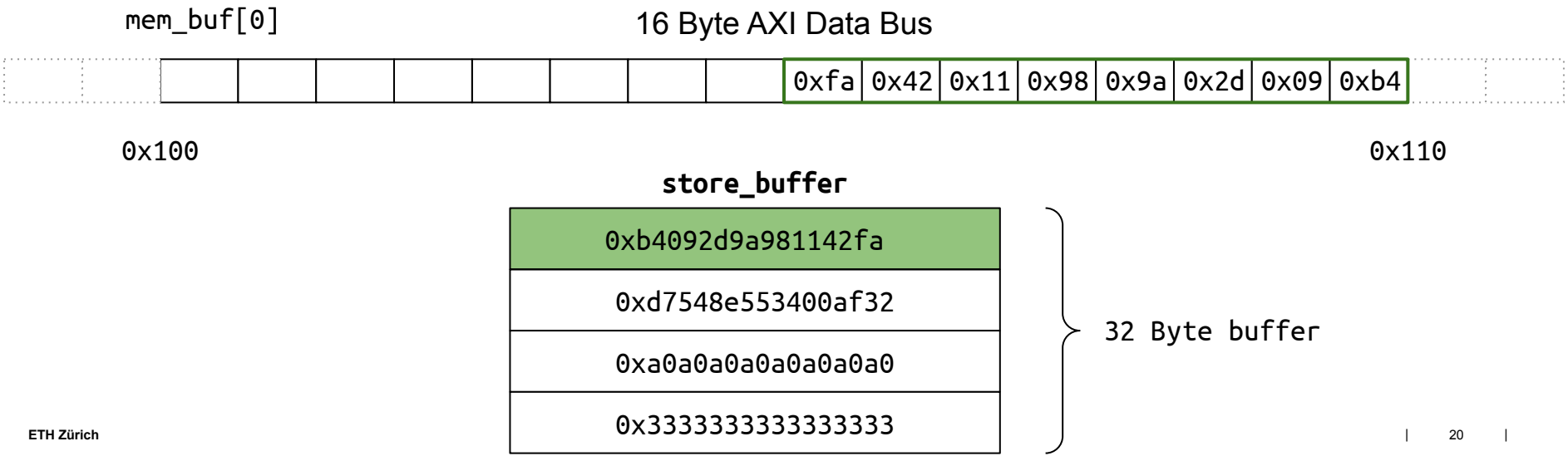

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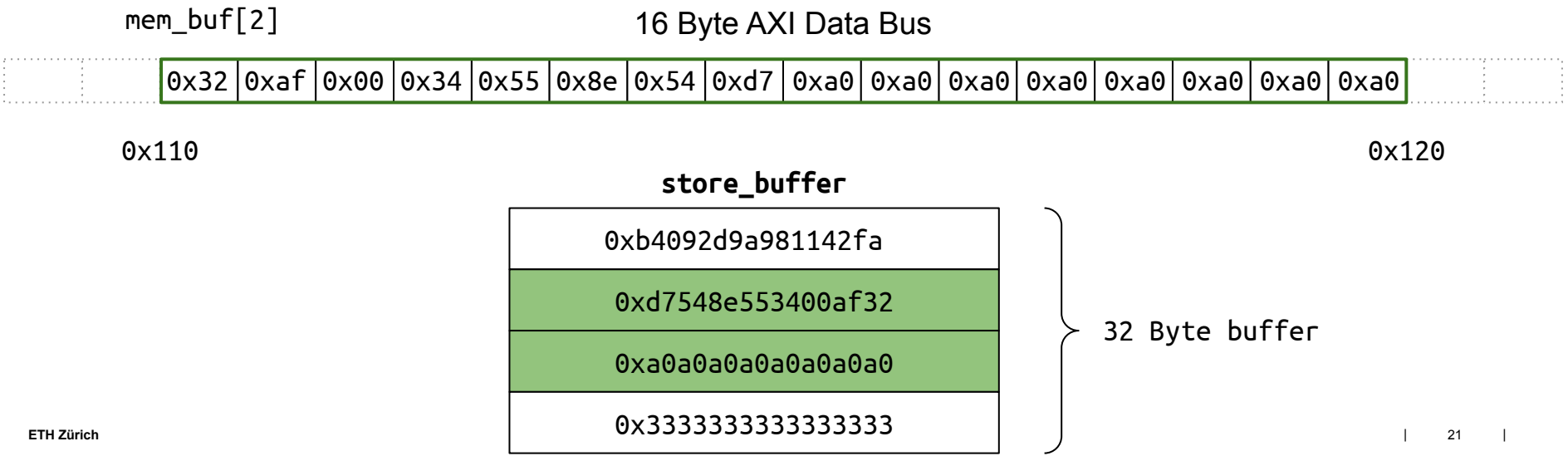

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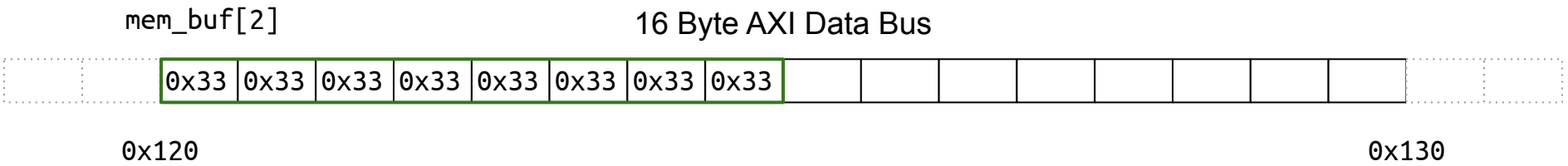
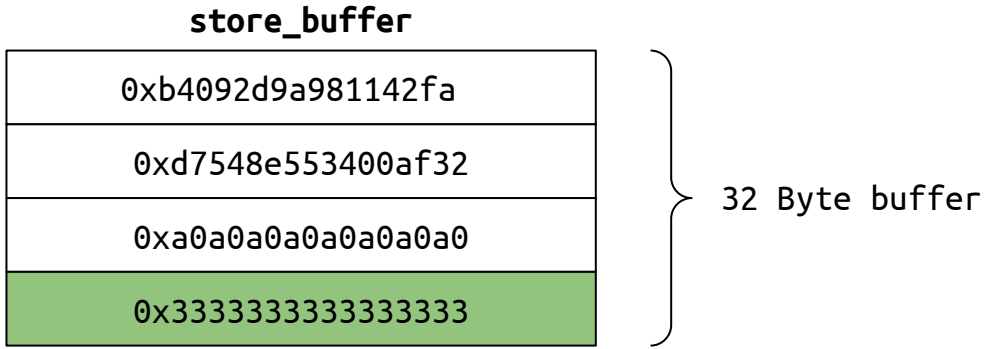


We need the next element to complete the AXI beat. But if we get the next element, we lose the previous one.



Support for misaligned stores

Multiple solutions:

- **Double buffer**
  - We always keep also the next elements
- **Independent ready-signals to the lanes**
  - Each buffer entry can be updated independently
- **Reduce the effective AXI width in case of misaligned store**
  - Less intrusive solution
  - Faster to implement
  - Misaligned stores are not common

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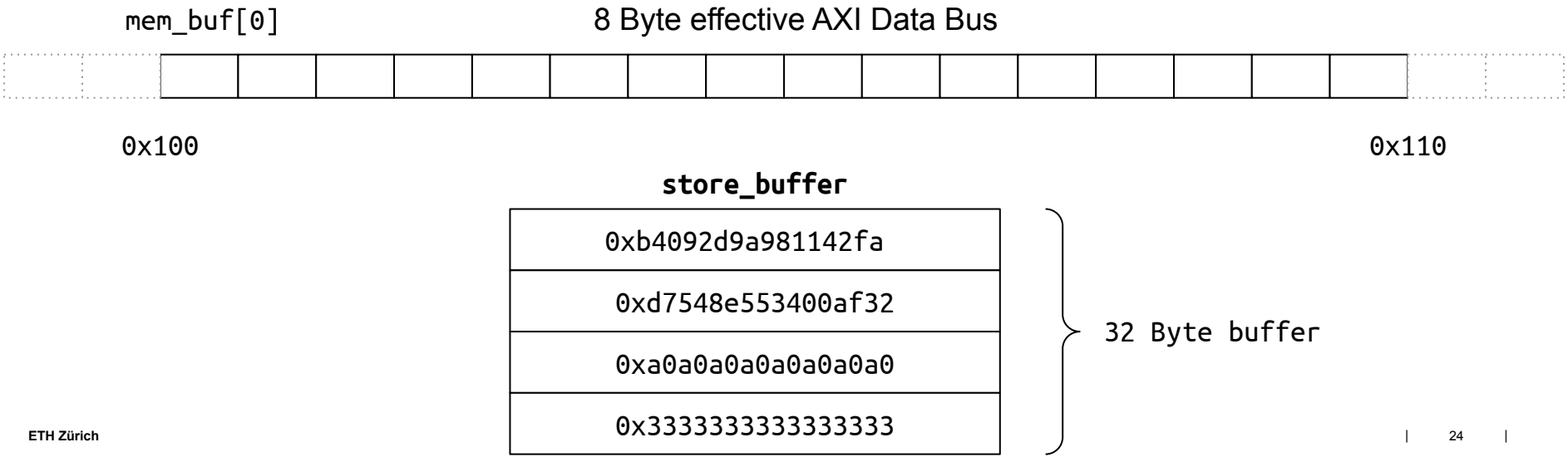

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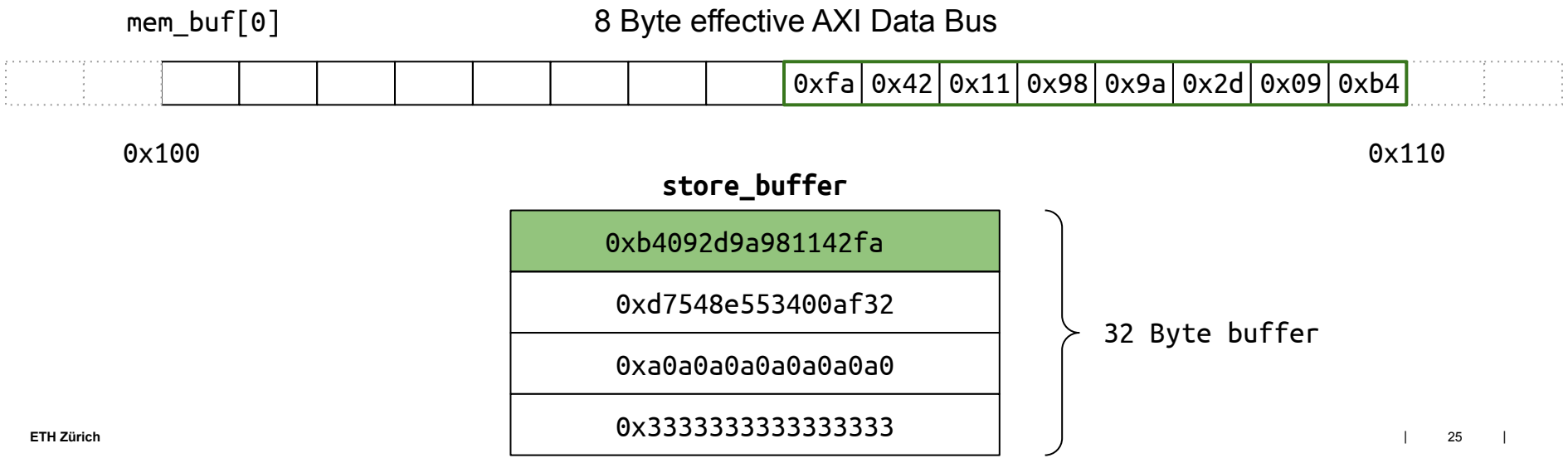

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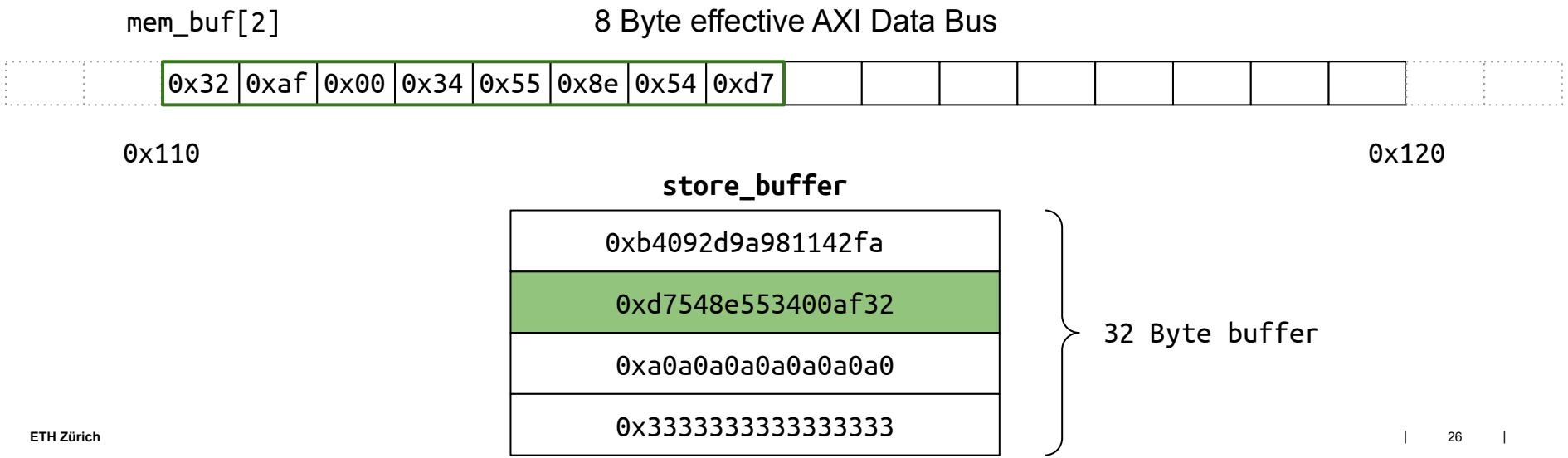

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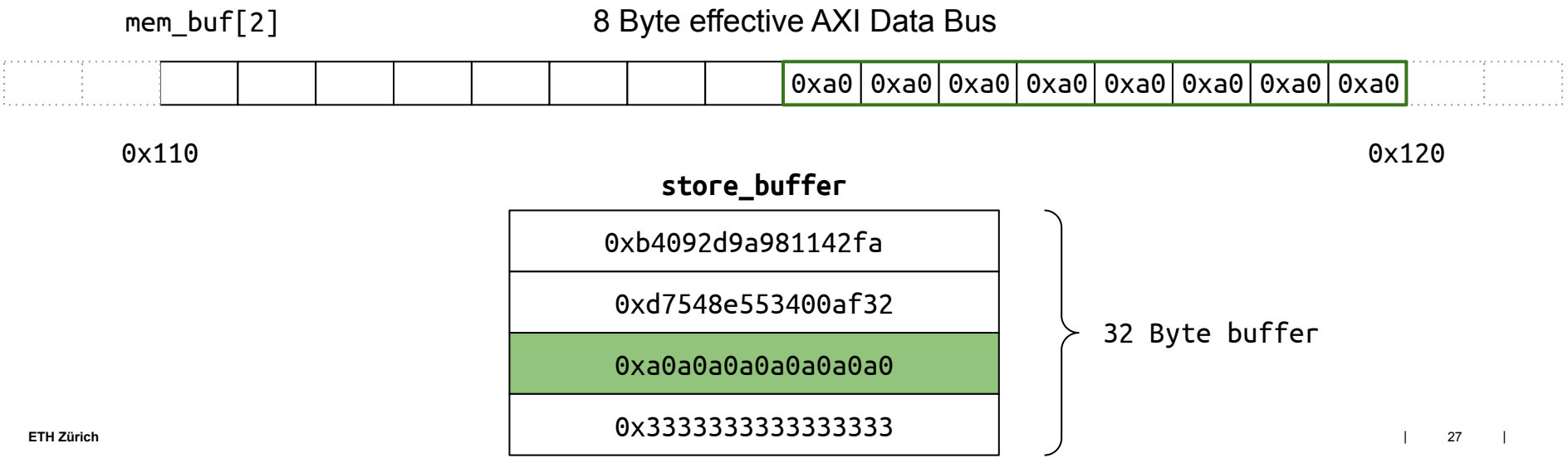

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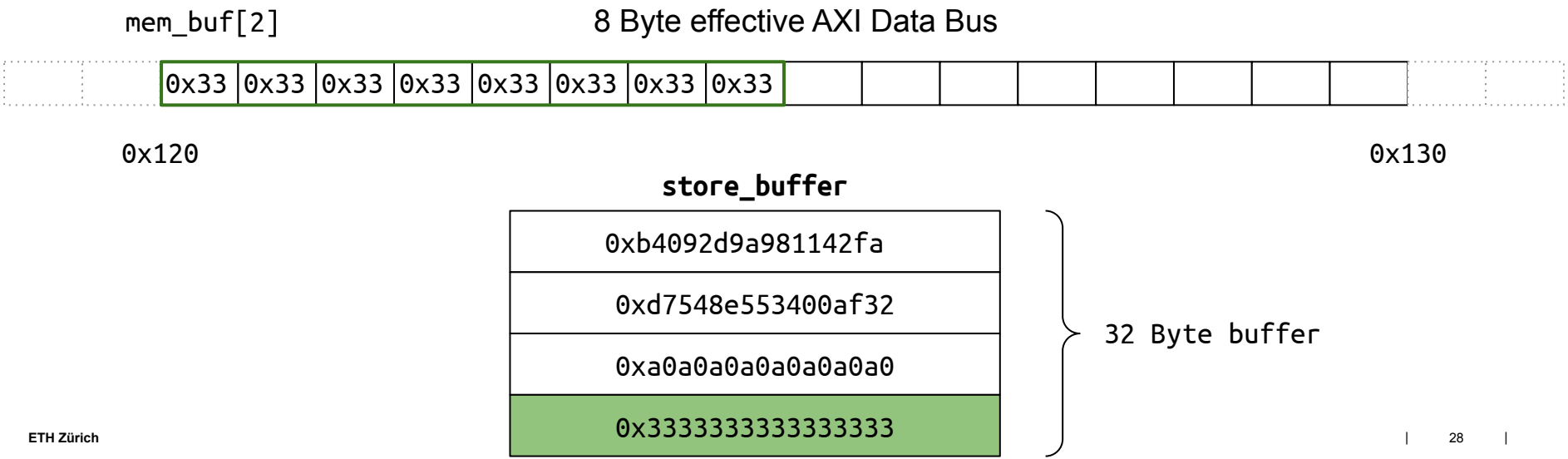

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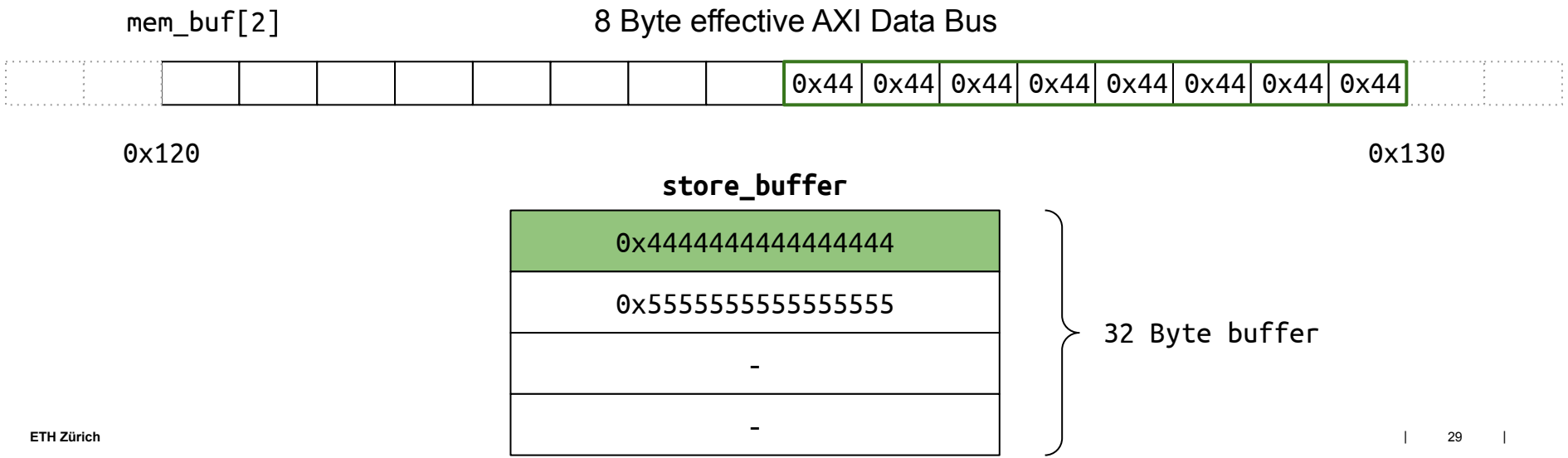

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