

Flexible vectors update

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Intel

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Agenda

- ▶ Phase 2 entry requirements
- ▶ Current status
- ▶ Changes to the proposal since the previous update
 - ▶ Lane index bounds checking
 - ▶ Shuffle operations

Phase 2 entry requirements

- ▶ Precise and complete overview document is available in a forked repo around which a reasonably high level of consensus exists.
- ▶ *Updates to the actual spec document, test suite, and reference interpreter are NOT yet required.*

Current status

- ▶ Added all classes of operations
- ▶ Expected some tweaks based on performance

Changes since the previous update

New instructions and some restrictions:

- ▶ Lane index bounds checking
- ▶ Shuffle operations

Lane index bounds checking

Old 'extract lane' and 'replace lane' were taking immediate arguments, which could be out of bounds.

Solution:

- ▶ Change existing 'extract' and 'replace' to take regular integer arguments, but trigger a bounds check at runtime
- ▶ Fallback operations with immediate indices within 128 bits (no bound checking)
- ▶ New 'extract' and 'replace' operations that take their argument modulo the lane count

Shuffle operations

New operations added (already had lane shift):

- ▶ Concat parts of input vectors
- ▶ Select odd lanes from one vector and even - from the other one
- ▶ Reverse lane order
- ▶ Duplicate odd lanes into lower even lanes