

Document No: SC22/WG21 N4752

Date: 2018-06-08

Project: Programming Languages – C++ Extensions for Parallelism Version 2

References:

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Responses to National Body Comments for ISO/IEC PDTS 19750, C++ Extensions for Parallelism Version 2

Attached is a complete set of National Body Comments submitted to JTC1/SC22 in response to the SC22 Ballot for ISO/IEC PDTS 19750, Proposed Draft Technical Specification for C++ Extensions for Parallelism Version 2.

Document numbers references in the ballot comments are WG21 documents unless otherwise stated.

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|------------------------|----------------|----------------------|----------------------------|---------------------------------|---|--|--|
| CA 001 | | 02 | | ed | The introductory wording differs from that specified by the ISO/IEC Directives, Part 2:2016. | Use the wording from the Directives. The introductory wording provided by the eighth edition of the Directives is identical to that of the seventh. | Accepted. |
| CA 002 | | 03 | | ed | The introductory wording differs from that specified by the ISO/IEC Directives, Part 2:2016. For example, the version presented in the PDTS under ballot includes a typographical error, with "us" in place of "use". | Use the wording from the Directives; specifically, at least ISO/IEC 14882 should be referenced as containing terms and definitions applicable to document under ballot. The introductory wording provided by the eighth edition of the Directives is identical to that of the seventh. | Accepted. |
| US 003 | | 04.01 p1 | | te | [parallel.general.namespaces] p1 - This paragraph states that "Unless otherwise specified, all components described in this Technical Specification are declared in namespace <code>`std::experimental::parallelism_v2`</code> ". In all the header synopsis <code>parallelism_v2</code> is an inline namespace. The design intention is that it is an inline namespace, but that's not clear in [parallel.general.namespaces]. | Change this paragraph to "Unless otherwise specified, all components described in this Technical Specification are declared in an inline namespace <code>`parallelism_v2`</code> within the the namespace <code>`std::experimental`</code> ". | Accept with modification: Resolved by P1111r0 . |
| CA 004 | | 04.02 | Table 1 | ed | The applicability of the designators under the Doc. No. column is unclear; these designators are not mentioned in the PDTS under ballot in the Normative references, and there is no Bibliography. | Strike the column in question. | Accept with modification: Resolved by P1111r0 . |
| CA 005 | | 05.01 | Paragraph 2 | Te | JTC 1/SC 22/WG 21 N4741 indicates the value type of the iterator in the similar case of <code>tzdb_list</code> . | Specify the value type of the iterator in the subject paragraph. | Accept with modification: Resolved by P1111r0 . |
| US 006 | | 07.02.1 | | ed | [parallel.alg.ops.synopsis] - Some of the comments are awkward and not in italic font. Example: "// 7.2.2 Reductions Support for reductions". | Rephrase the comments and change them to the correct font. | Accepted. |
| US 007 | | 07.02.1 9.2 | | te | [parallel.alg.ops.synopsis] and [parallel.simd.synopsis] - This document has two different <code>nodeduce</code> exposition-only metafunctions in two different sections | Reevaluate the need and design of these deduction helpers. Consider combining <code>`no_deduce`</code> and <code>`nodeduce`</code> . | Accept with modification: Resolved by P1111r0 . <code>`no_deduce`</code> and <code>`nodeduce`</code> have been |

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| | | | | | (`no_deduce` in vector execution policies [parallel.alg.ops.synopsis] and `nodeduce` in simd types [parallel.simd.synopsis]), and one non-exposition-only deduce metafunction `simd_abi::deduce` [parallel.simd.synopsis]. | | combined and renamed it to `type_identity` (see P0887r0). |
| CA 008 | | 07.02.2 | Paragraph 3 | ed | The note in the subject paragraph begins with a sentence whose first word is not capitalized. | Replace the first instance of "in" in the subject note with "In". | Accept with modification: Resolved by P1111r0 . |
| CA 009 | | 07.02.4 | | ed | There is a blank page. | Remove the blank page. | Accepted. |
| CA 010 | | 07.02.4 | Paragraph 3 | ed | The last note in the subject paragraph begins with a sentence whose first word is not capitalized. | Replace the first instance of "if" in the subject note with "If". | Accepted. |
| US 011 | | 09 | | ed | [parallel.simd] "i" in "j" are sometimes in math font, sometimes in code font. Example: "i" in "i-th" is in math font not code font in several places. | Be consistent. Put "i" in "j" in code font everywhere. | Accept with modification: Resolved by P1111r0 (which follows the guidance given in ISO 80000-2 and the WG21 editing guidelines) and consistently uses math font. See related comment CA 16. |
| US 012 | | 09 | | ed | [parallel.simd] - The PTDS PDF document does not have the correct math symbols in some places. The HTML drafts of the document do not have this issue. Example: [parallel.simd.alg] p2, p4, p6 and p9 is rendered as "i ? [0, size()]" instead of "i ∈ [0, size()]". | Fix the PDF generation to generate math symbols correctly. | Accept with modification: Resolved by P1111r0 (which follows the guidance given in ISO 80000-2 and the WG21 editing guidelines). See related comments CA 15, CA 17, and CH 35. |
| US 013 | | 09 | | te | [parallel.simd] - The acronym SIMD should be defined somewhere in this document. | Define the acronym SIMD somewhere in this document. | Rejected: SIMD is not used normatively and it is a common term of art. |

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| DE 014 | | 09 | | ge | Masked assignment / blending on masks (vectorized conditions) could be generalized and simplified considerably through the use of the conditional operator. | Prioritize P0917R1 to make operator?: overloadable. | Rejected: The paper will be handled in due course. |
| CA 015 | | 09 | | te | The subject clause contains incomprehensible strings of text incorporating question marks (?) such as "i ? [0, M::size())". | Replace the question marks with appropriate symbols, ensuring that the intended meaning of the resulting expressions is that defined by ISO 80000-2, and that the normative text appropriately references ISO 80000-2 for the interpretation. | Accept with modification: Resolved by P1111r0 (which follows the guidance given in ISO 80000-2 and the WG21 editing guidelines). See related comments US 12, CA 17, and CH 35. |
| CA 016 | | 09 | | ed | ISO/IEC 14882:2017 uses <i>i</i> th , with "i" in italics and "th" in superscript where the PDTs under ballot uses <i>i</i> -th. Further references to the variable <i>i</i> can be seen in ISO/IEC 14882:2017 subclause 23.5.3.1 [tuple.cnstr] paragraph 14 to also appear in italics even in code contexts, whereas the PDTs can be seen to use code font in at least some cases. | Consistency with ISO/IEC 14882 suggests that code font should not be used for variables introduced in prose or mathematical expressions: replace code font instances of such variables with sloping type. Replace "-th" with "th" in superscript. | Accept with modification: Resolved by P1111r0 (which follows the guidance given in ISO 80000-2 and the WG21 editing guidelines) and consistently uses math font. See related comment US 11. |
| CA 017 | | 09 | | te | Various instances of the character U+2223 are present in the subject clause where the usage does not agree with that of ISO 80000-2:2009 (namely <i>divides</i>). ISO 80000-2:2009 specifies U+007C as the separator in set-builder notation. | Notwithstanding the informative alias provided by ISO/IEC 10646 of "such that" for U+2223, follow the usage prescribed by ISO 80000-2. | Accept with modification: See the wording in P1111r0 and related comment US 12, CA 15, and CH 35. |
| US 018 | | 09.02 | | te | [parallel.simd.synopsis] - Why is fixed_size's NTTP signed? | Reevaluate and clarify the design intent and rationale. | Rejected: The non-type template parameter's value will always be small. It is inconsistent with other places in the standard where size_t is used for NTTPs, but using a signed type was an explicit design decision. There is no consensus for change. |
| DE 019 | | 09.02, 9.4.5 | p24 | te | The type V::value_type is bool if V is a simd_mask specialization. Consequently, the | Change the signature to template<class V, class Abi> array<V, simd_size_v<typename | Accepted. |

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| | | | | | return type and parameter type of the simd_mask split overload is incorrect. | V::simd_type::value_type, Abi> / V::size()> split(const simd_mask<typename V::simd_type::value_type, Abi>& x); | |
| CH 020 | 1 | 09.02.1 | | te | scalar and fixed_size might not need a definition. | Consider making these types incomplete. | Accept with modification: Resolved by P0820r4 . |
| CH 021 | 2 | 09.02.1 | | ed | Type of max_fixed_size is misspelled. | Replace "in" by "int". | Accepted. |
| CH 022 | 3 | 09.02.1 | 9, Example | ed | The example has a typo. | "compatible<T> is an alias" -> "compatible<T> as an alias" | Rejected: The wording in question was removed to address CH 4, so the proposed resolution is no longer needed. See P1111r0 . |
| CH 023 | 4 | 09.02.1 | 9, Example | ed | Consider wording the bulleted list in the example following the style of [parallel.simd.abi].p10 | The implementation therefore defines compatible<T> as an alias for - scalar if T is long double, and - __simd128 for all vectorizable T | Accept with modification: Resolved by P1111r0 . |
| DE 024 | | 09.02.1 | p11-p14 | te | There are valid use cases that require ABI deduction to take ingoing ABI tags into account. The current interface is not general enough. See P0820R1 for motivation. | Apply the wording changes as presented in P0964R1. i.e. add a Abis template parameter pack. | Accept with modification: Resolved by P0964r2 . |
| CH 025 | 7 | 09.02.1 and others | 1 | ed | Should not provide a definition in the code part, for consistency reasons; see for instance the specification of tuple_size in [tuple.helper] | Remove the definition from the code elements. | Rejected: No consensus for change. |
| DE 026 | | 09.02.2 | | ge | Producing related types for split/concat/shuffle operations or mixed precision calculations is currently too cumbersome and error prone. | Apply the wording additions as presented in P0964R1, which add the rebind_simd and resize_simd traits. | Accept with modification: Resolved by P0820r4 , P0964r2 , and P1111r0 . |
| CH 027 | 5 | 09.02.2 and others | 1 | ed | Throughout the document, several occurrences of "base characteristic" are spelled as BaseCharacteristic. | Change to "base characteristic" (in regular font) | Accepted. |

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| CH 028 | 6 | 09.02.2 and others | 1 | ed | Should be using "Remarks" element for remarks, for consistency reasons; see for instance the specification of tuple_size in [tuple.helper] | Consider using "Remarks" element. | Rejected: No consensus for change. |
| US 029 | | 09.02.2 p7 9.3.3 p4 9.3.3 p7 | | ed | [parallel.simd.traits] p7, [parallel.simd.ctor] p4 and p7 - Only the penultimate item should have "or"/"and" (see [complex.numbers] p4 for precedence). Example: [parallel.simd.traits] p7 the first bullet "element_aligned_tag, or" should be "element_aligned_tag". | Change the lists to only have "or"/"and" in the penultimate list item. | Rejected: The IS style is to have the "or"/"and" on every bullet point except the final one. |
| CH 030 | 12 | 09.02.3 | | te | Several function templates are not marked noexcept, nor are they specified as "Throws: nothing", even though they cannot throw for any allowed specialization. | Consider making them noexcept instead, or conditionally noexcept based on the noexceptness of the operation on the underlying, "vectorizable T". Consider especially increment, decrement, and copy_from. | Accept with modification: Resolved by P1111r0 , which makes everything in the simd library without preconditions `noexcept`. |
| CH 031 | 9 | 09.02.3 | 8 | ed | Code indentation is inconsistent. | Fix it. | Accepted: See related comment US 53. |
| CH 032 | 10 | 09.02.3 | 8 | ed | For consistency reasons, code elements should not have paragraph numbers. | Remove them. | Accept with modification: Remove paragraph numbers from code blocks. |
| CH 033 | 11 | 09.02.3 and others | 8 | te | Several interfaces are specified as "Throws: nothing". | Consider making them noexcept instead, or conditionally noexcept based on the noexceptness of the operation on the underlying, "vectorizable T". | Accept with modification: Resolved by P1111r0 , which makes everything in the simd library without preconditions `noexcept`. |
| US 034 | | 09.02.3 p12 9.2.3 p26 9.3.3 p13, 9.3.4 p2, 9.3.4 p6, | | ed | [parallel.simd.whereexpr] p12 and p26, [parallel.simd.ctor] p13, [parallel.simd.copy] p2 and p6, [parallel.simd.reductions] p7, and [parallel.simd.mask.ctor] p2 and p6-p7 - These paragraphs are a bit difficult to read. | Restructure these paragraphs as bulleted lists (each sentence on a separate bullet). | Accepted. |

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| | | 9.4.4 p7, 9.5.2 p2, 9.5.2 p6, 9.5.2 p7, | | | They would be better expressed as bulleted lists (each sentence on a separate bullet). | | |
| CH 035 | 8 | 09.02.3, 9.4.5, and others | 5 | ed | Formulae / "math expressions" do not render correctly, for instance "element of"; several occurrences in this document! | Fix it. | Accept with modification: Resolved by P1111r0 (which follows the guidance given in ISO 80000-2 and the WG21 editing guidelines). See related comments US 12, CA 15, and CA 17. |
| US 036 | | 09.03.1 9.5.1 | | ed | [parallel.simd.overview], [parallel.simd.mask.overview] - There are no comments with section references for the `simd` and `simd_mask` constructors. | Add section references to the constructor comments in the same style as the references other comments in the synopsis have. Example: change "// implicit conversion constructor" to "// 9.3.3 implicit conversion constructor" | Accepted. |
| US 037 | | 09.03.1 9.5.1 | | ed | [parallel.simd.overview] and [parallel.simd.mask.overview] - Some paragraphs seem to be out of order. Example: [parallel.simd.overview] p6, starting with "Implementations should enable explicit conversion from and to implementation-defined types.", comes after [parallel.simd.overview] p4-5, which describe the size member function. The description of the size member function should be below, in a subsection, with the rest of the member functions. | The description of the size member function should be below, in a subsection, with the rest of the member functions. | Accept with modification: Resolved by P1111r0 . |

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| CH 038 | 13 | 09.03.1 | Synopsis | ed | Missing ';' after using mask_type = simd_mask<T, Abi> | Fix it. | Accepted. |
| US 039 | | 09.03.1 p6 | | ed | [parallel.simd.overview] p6 - Declaring two functions on the same line is awkward. | Split "explicit operator implementation-defined() const; explicit simd(const implementation-defined& init);" into two lines (e.g. one declaration per line). | Accepted. |
| US 040 | | 09.03.2 p22 | | ed | [parallel.simd.reference] p22 - "Effects: Exchanges the values a and b refer to." seems inaccurate; a and b themselves are swapped. | Change "Effects: Exchanges the values a and b refer to." to "Effects: Exchanges the values a and b." | Rejected: The referenced element of a simd/simd_mask are getting swapped. The proposed change is incorrect. |
| US 041 | | 09.03.3 p4, 9.4.5 p2, 9.4.5 p8 | | ed | [parallel.simd.ctor] p4, [parallel.simd.casts] p2 and p8 - When declaring placeholders, typically we use the word "denote" instead of "identify". Example: "Let `From` identify the type ..." | Replace the word "identify" with "denote". | Accept with modification: Resolved by P1111r0 . |
| US 042 | | 09.04.1, 9.4.3, 9.6.1, 9.6.3 | | te | . Text says "A simd object initialized with the results of the element-wise application of the indicated operator." Applied to WHAT? | Something like "A simd object initialized with the results of applying the indicated operator element-wise to lhs and rhs." Important to indicate to what the operator is being applied. | Accept with modification: Resolved by P1111r0 . |
| US 043 | | 09.04.2, 9.6.2 | | te | . Text says: "These operators perform the indicated binary element-wise operation" This is really vague. | State more clearly what the source and destination of the operations are. | Accept with modification: Resolved by P1111r0 . |
| US 044 | | 09.04.4 p4 9.4.4 p11 9.4.4 p14 9.4.4 p18 | | ed | [parallel.simd.reductions] p4, p11, p14, and p18 - In places where GENERALIZED_SUM is referenced, add a section reference to the part of IS that defines GENERALIZED_SUM. This is assuming that we can add references | Add as needed | Accept with modification: Resolved by P1111r0 . |

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| | | | | | to things in the IS; we appear to have no other references to the IS. | | |
| US 045 | | 09.04.5 | | ed | [parallel.simd.casts] p12 - This paragraph is a bit difficult to read. | Remove otherwise from the first two bullets, and add "Otherwise, " to the start of the last bullet. | Accept with modification: Resolved by P1111r0 . |
| CH 046 | 15 | 09.04.5 | 12 | te | "simd<T, Abi> if either U is T or U and T are integral types that only differ in signedness". char is neither unsigned nor signed char. But it will only differ in signedness from one of them. Can I only call static_simd_cast from char to either unsigned or signed char? | Suggest adding "or T and U are the type char, signed or unsigned char". | Accept with modification: Resolved by P1111r0 . |
| CH 047 | 14 | 09.04.5 | 6 | ed | In "simd<T, Abi> is U is T, otherwise", the first "is" is meant to read "if". | Fix it. | Accepted. |
| DE 048 | | 09.04.5 | p26 | te | Same issue as above. However the wording applies to both the simd and simd_mask overloads. | Replace simd_size_v<V::value_type, Abi> with simd_size_v<V::simd_type::value_type, Abi> for the simd_mask overload. | Accept with modification: Resolved by P1111r0 . |
| US 049 | | 09.04.7 p1 | | te | [parallel.simd.math] p1 - I still have a hard time understand the wording of this paragraph. Just to be clear, the intention is that there are math functions for the simd type, and that we allow vendors to implement this by providing math functions that take/return built-in vector types (like __float128) as long as their `simd<T, Abi>` is convertible to/from that built-in type if they want (instead of providing overloads for `simd<T, Abi>`) - correct? | Clarify the intended meaning of this paragraph. | Rejected: No consensus for change. |
| US 050 | | 09.04.7 p2 | | te | [parallel.simd.math] p2 - What does this mean: "The results per element are not required to be bitwise equal to the application of the function which is overloaded for the element type."? Does this say that the simd overloads may not give the | Clarify the intended meaning of this paragraph. | Accept with modification: Resolved by P1111r0 . |

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| | | | | | same result as applying the scalar overload on each element? | | |
| US 051 | | 09.06.4 p17 9.6.4 p18 9.6.4 p19 9.6.4 p20 9.6.4 p21 9.6.4 p22 9.6.4 p23 9.6.5 p3 9.6.5 p4 9.6.5 p5 | | te | [parallel.simd.mask.reductions] p17-23 and [parallel.simd.mask.where] p3-5 - Where are the "see below" parameters for these functions defined? | Clarify where these "see below" parameters are described, or add wording describing them. | Accept with modification: Resolved by P1111r0 . |
| US 052 | | 1 p3 | | te | [parallel.scope] p3 - "The goal of this Technical Specification is to build widespread existing practice for parallelism in the C++ standard algorithms library." is probably too narrow for v2. | Replace this wording with a broader definition of the scope of this document. | Accepted: See related comment CH 31. |
| US 053 | | Entire document | | ed | The indentation for multi-line code blocks in definitions is incorrect; every line after the first is indented. | Correct indentation throughout the document. | Accept with modification: Resolved by P1111r0 . |

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