

## WG14 N2467

### Meeting notes

## C Floating Point Study Group Teleconference

2019-11-20

8 AM PST / 11 AM EST / 4 PM UTC

**Attendees:** Rajan, Fred, Jim, David H, Mike, Ian

#### **New agenda items:**

Jens email (SC22WG14.17316) WG14 governance

#### **Carry over action items:**

CFP: Put the tgmath redefinition as a proposal to the standard once we have a base document with TS Part 3 in it. Carry over again.

#### **Last meeting action items:**

CFP: Follow up on CFP1419 via email. DONE

Jim: Create a WG14 paper for the next Spring 2020 WG14 meeting along the lines of CFP1411. DONE

#### **New action items:**

Fred: Update erange proposal based on CFP 1437 and CFP teleconference discussion.

Jim: Submit [http://wiki.edg.com/pub/CFP/WebHome/C2x\\_proposal\\_-\\_NaN\\_and\\_infinity\\_macros\\_-\\_20191108.pdf](http://wiki.edg.com/pub/CFP/WebHome/C2x_proposal_-_NaN_and_infinity_macros_-_20191108.pdf) to WG14.

Rajan: Compile example code in [http://wiki.edg.com/pub/CFP/WebHome/C2x\\_proposal\\_-\\_why\\_no\\_wide\\_string\\_strfrom\\_functions\\_v2.pdf](http://wiki.edg.com/pub/CFP/WebHome/C2x_proposal_-_why_no_wide_string_strfrom_functions_v2.pdf).

Jim: Choose how to attach footnote in [http://wiki.edg.com/pub/CFP/WebHome/C2x\\_proposal\\_-\\_why\\_no\\_wide\\_string\\_strfrom\\_functions\\_v2.pdf](http://wiki.edg.com/pub/CFP/WebHome/C2x_proposal_-_why_no_wide_string_strfrom_functions_v2.pdf); mention the other approach in the problem description.

Jim: Draft a paper proposing changing the “cr” prefix for correctly rounded functions to “cr\_”. Include with other suggested changes in response to Jens’s naming paper.

David H: Draft words to recommend honoring properties of math functions that would follow automatically from correct rounding.

Jim: Find a place for words about math function properties. Coordinate with David H (previous AI).

Jim: Draft a proposal to change the return words for powr and add the footnote (presented in the meeting) to justify powr.

#### **Next Meeting(s):**

Thursday, January 9th, 2020, 11:00 EST, 8:00 PST, 4PM UTC

Same teleconference number.

Please notify the group if this time slot does not work.

#### **Discussion:**

754 revision:

This is the final resting place for the public records of 754-2019 development, [http://grouper.ieee.org/groups/msc/ANSI\\_IEEE-Std-754-2019](http://grouper.ieee.org/groups/msc/ANSI_IEEE-Std-754-2019)

in the IEEE SA MSC page.

<http://grouper.ieee.org/groups/msc/index.html>

C++ Liaison:

Nothing.

Jens's email (SC22WG14.17316) WG14 governance

Discussed content and relevance to CFP.

Concerns about transition to new editor and work in progress.

WG14 meeting in Ithaca

See CFP 1432 - Rajan's report on CFP related issues

Excerpts ...

Here is a summary of the results for what was discussed for floating point papers yesterday. Note that we have one action item (reword N2400), and also the proposal for Part 5 a and b went a lot better than last time and we got on the verge of approval (but not quite).

N2384 Thomas, C2X proposal - F.8 update

Goes into C2X.

N2400 Thomas, C2X proposal - why no wide string strfrom functions

CFP to send this text to the editor as a footnote and a recipe (steps to get wide string version of strfrom code example) form.

N2406 Tydeman, SNAN: initialization and unary +

Goes into C2X.

N2407 Thomas, Proposal for C2X - TS 18661-5abc supplementary attributes

Straw poll: Does the committee want TS 18661-5a to be brought into C2X?

Result: 5/3/5. Not quite approval.

Straw poll: Does the committee want TS 18661-5b to be brought into C2X?

Result: 4/3/6. Not approved.

N2416 Thomas, Proposal for C2X - floating-point negation and conversion

Goes into C2X.

N2424 Thomas, Proposal for C2X proposal – Why logp1?

Goes into C2X.

The naming proposal did not pass and there were no action items for CFP from it. WG14 didn't get into the cr prefix or NaN and infinity macro names.

N2409 (reserved names) is something we should track for changes affecting CFP.

There was no resolution about intmax\_t.

C2X integration (<http://www.open-std.org/jtc1/sc22/wg14/www/docs/n2433.pdf>):

Draft includes TS 1, 2, and 4a

TS 5abc inclusion into C2X nearly passed. Might should be resubmitted later.

Part 3 integration status in question, given Jen's email.

Too early to update parts not integrated into C2X. Need ISO approval to republish TS.

#### **Action item details:**

CFP: Follow up on CFP1419 via email.

See CFP 1437.

Talked through changes proposed in 1437.

Agreed to be consistent on saying "magnitude of", even if redundant as in "magnitude of positive finite x is too large.

Agreed to split non-symmetric cases to state positive and negative cases separately, as in 1437, e.g., in exp and expm1.

Agreed to "A range error occurs for some finite x, depending on p" for ldexp, and similar words for scalbn and scalbln and elsewhere where characterization of range errors is complicated.

Agreed to "A range error occurs for some finite arguments" for fdim.

Agree to avoid "may occur" in general.

\*AI\*: Fred: Update erange proposal based on CFP 1437 and CFP teleconference discussion.

Jim: Create a WG14 paper for the next Spring 2020 WG14 meeting along the lines of CFP1411.

[http://wiki.edg.com/pub/CFP/WebHome/C2x\\_proposal - NaN and infinity macros - 20191108.pdf](http://wiki.edg.com/pub/CFP/WebHome/C2x_proposal_-_NaN_and_infinity_macros_-_20191108.pdf)

Reviewed.

Ok to submit to WG14? Yes.

\*AI\*: jJim submit to WG14.

From WG14:

N2400 Thomas, C2X proposal - why no wide string strfrom functions

CFP to send this text to the editor as a footnote and a recipe (steps to get wide string version of strfrom code example) form.

See CFP 1436.

[http://wiki.edg.com/pub/CFP/WebHome/C2x\\_proposal - why no wide string strfrom functions v2.pdf](http://wiki.edg.com/pub/CFP/WebHome/C2x_proposal_-_why_no_wide_string_strfrom_functions_v2.pdf)

\*AI\*: Rajan: compile code in example.

\*AI\*: Jim: Choose how to attach footnote and mention the other approach in the problem description.

#### Other issues:

N2426 -- naming issues

Shall we propose changing to `cr_`? Agreed.

Rajan: Include with other changes in response to naming paper.

AI: Jim draft a proposal and include other suggested changes in response to naming paper.

Specifying more special cases for math functions, e.g., periodicity for half-revolution trig functions. Perhaps as recommended practice.

Are we going to propose adding anything?

Jim: Could there be a note or recommended practice for implementations to honor function properties that would hold if the function were correctly rounded, e.g., monotonicity, periodicity, exact cases, ertc.

\*AI\*: David H: Draft words to recommend honoring properties of math functions that would follow automatically with correct rounding.

\*AI\*: Jim: Find a place for words about math function properties. Coordinate with David H.

powr

Currently says "The powr functions compute  $x$  raised to the power  $y$  as  $e^{(y \log x)}$ . ..." and "The powr functions return  $x^y$ ."

Would it be better to say "The powr functions return  $e^{(y \log x)}$ ."? Agreed yes.

Jens suggested a note about `pow` vs `powr`.

Jim: How about a footnote attached to the first sentence in the Description where the footnote is:

(\*) Restricting the domain to that of the formula  $e^{(y * \log(x))}$  is intended to better meet expectations for a continuous power function and to allow more efficient implementation by avoiding some case analysis.

\*AI\*: Jim: draft a proposal to change the return words and add a footnote.

Attributes - recent WG14 email thread

Does this pertain to CFP?

Jim: A vehicle for CFP pragma functionality?

Rajan: current ideas are for attributes that don't apply to blocks, so no.

Followup on what does "normalized" mean in C? See CFP 1399

Defer.

- Jim Thomas