WG14 N3374
Meeting notes

C Floating Point Study Group Teleconference
2024/09/18: 8 AM PDT / 11 AM EDT / 3 PM UTC

[Please note that these minutes appear in agenda order, with carry-over and new agenda items appearing at the end.]

2024/09/18: 8 AM PDT

Attendees: Rajan, Jim, Jerome, Fred, Damian, David, Joshua

New agenda items (
https://wiki.edg.com/pub/CFP/WebHome/CFP%20meeting%20agenda-20240918-update.pdf
):

   SIGFPE
  [Cfp-interest 3264] SIGFPE paper   Fred J. Tydeman

Previous meeting notes:

   See([Cfp-interest 3253] JTC1/SC22/WG14/CFP 2024/08/14 Meeting minutes
-- v. 2
<http://%5BCfp-interest%203253%5D%20JTC1/SC22/WG14/CFP%202024/08/14%20Meeting%20minutes%20--%20v.%202>
).

Next Meeting(s):

   October 16, 2024, 3PM UTC

   ISO Zoom teleconference

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

IEEE 754 liaison:

   Damian & David: Large, newly-formed committee working on how to
expedite discussion of minor issues without the inevitable distractions.

C++ liaison:

None

WG14 meeting:

   30 Sept - 4 Oct in Minneapolis, MN

C23 integration:

   Mailing deadline is one month before the meeting, given above, so it has passed.

C documents:

   The C23 DIS draft is n3219 - 22 Feb 2024

   The working C2y draft is n3301 - 28 July 2024 - For CFP review only. Do not distribute.

Carry-over action items from last meeting:

   Damian: Ask 754 about midpoint and interpolation

      Damian: Will send email to 754, to carry over

   Jim: Include complex add and sub into the main body.

   Jim & everyone: Look at ways to strengthen the complex * and /, given the current code block.

      [Cfp-interest 3155] Specification of complex operators --Done

   Jim: Write up notes about frexp() and behavior for model numbers

      [Cfp-interest 3154] frexp and double-double --Done

Action items from last meeting:

   All: Investigate issue [Cfp-interest 3196] Fwd: [SC22WG14.26243] constexpr initialization seemingly can contai UB?I from email forwarded by Fred, involving a constant expression of the form 1.0/0.0, for example. --Done
   All: Investigate issue [Cfp-interest 3195] Fwd: [SC22WG14.26260] Can nan set errno? from an email forwarded by Fred, involving the possible setting of errno by the nan() functions. --Done
   Jim: Add 2 issues raised by Rajan regarding WG14. --Done
   Jim: Add actions for group in short term. --Done
   Jim: Draft proposal to remove instances of imaginary lingering in draft. --Done
      [Cfp-interest 3250] Lingering references to imaginary type

Jerome: add document # to pole proposal. --Done
N3324 2024/09/04 Thomas, C2Y proposal - wording for pole error --Done
Fred: investigate range error issue for llogb(), which differs from ilogb(). --Done
[Cfp-interest 3202] llogb() Fred J. Tydeman
Jerome: Identify fadd/fsub and fma "error may occur" issues and report. --carry over
Damian: Send email about sign conventions in Annex F & G proposal. --Done
[Cfp-interest 3200] Various Updates to Annex F+G
[Cfp-interest 3203] Re: Various Updates to Annex F+G
Damian & Jerome: Identify technical changes in the F & G proposal. Investigate ways to split the proposal into natural subsets. ---Done
Fred: Revise the proposal for SIGFPE and I/O, in light of further discussion --Done
[Cfp-interest 3264] SIGFPE paper

TS-4 and TS-5 revisions

Waiting to hear from ISO editors, or word that the TSes (as we submitted them) have been sent out to ballot.

C2y issues

None.

Discussion of issues

Moving complex ops spec from Annex G to main body
[Cfp-interest 3262] Re: Specification of complex operators Jim Thomas

[Cfp-interest 3263] Re: Specification of complex operators Damian McGuckin
[Cfp-interest 3267] Re: Specification of complex operators Jim Thomas
[Cfp-interest 3272] Re: Specification of complex operators Damian McGuckin
[Cfp-interest 3273] Re: Specification of complex operators Damian McGuckin
[Cfp-interest 3278] Re: Specification of complex operators Paul Zimmermann
[Cfp-interest 3275] Re: Specification of complex operators Jim Thomas

Jim: Discussed paper close to ready to be a proposal. Propose to add more substantive discussion than current table of operations. Introduce "x + I y" usage. Explain complex mul, avoiding "undue" exceptions, leading to other operations. This replaces the tables.

Fred: Won't cover cases involving IEEE signed 0 and NaN. Suggest at least a footnote about special values.

Rajan: ...not necessarily just IEEE values.

Joshua: Not sure "compute" is best word. Like the idea of specifying what is wanted, even without all the details.

David: "Evaluates"?

Jim: Also a tricky word. Decide to take another turn and discuss again.

Jim: Clarify the usage of "I"

frexp and double-double
[Cfp-interest 3100] Issue: frexp and double-double underflow Hubert Tong
[Cfp-interest 3101] Re: Issue: frexp and double-double underflow Fred J. Tydeman
[Cfp-interest 3102] Re: Issue: frexp and double-double underflow Fred J. Tydeman
[Cfp-interest 3103] Re: Issue: frexp and double-double underflow Hubert Tong
[Cfp-interest 3104] Re: [SC22WG14.25365] Issue: frexp and double-double underflow Hubert Tong
[Cfp-interest 3154] frexp and double-double Jim Thomas

Jim: Review issue of double double. Two suggestions. One lets result be unspecified if value not a model number. Other path is a dead end.

David: Say as little as possible.

All: agree to first option

constexper initialization with UB
[Cfp-interest 3196] Fwd: [SC22WG14.26243] constexpr initialization seemingly can contain UB? Fred J. Tydeman
[Cfp-interest 3225] Re: [SC22WG14.26243] constexpr initialization seemingly can contain UB? Jim Thomas
[Cfp-interest 3226] Re: [SC22WG14.26243] constexpr initialization seemingly can contain UB? Fred J. Tydeman

Jim: Discuss proposed language for UB

Rajan: WG14 seems to want more language, but can try this first

nan function and errno
[Cfp-interest 3195] Fwd: [SC22WG14.26260] Can nan set errno? Fred J. Tydeman
[Cfp-interest 3198] Re: Can nan() set errno? Fred J. Tydeman
[Cfp-interest 3210] Re: Can nan() set errno? Jim Thomas
[Cfp-interest 3227] Re: Can nan() set errno? Fred J. Tydeman
[Cfp-interest 3229] Re: Can nan() set errno? Jim Thomas

Jim: Tied to strtod()

Jerome: Should be simple, quiet NaN value, not an exotic implementation-defined value with extra functionality.

Joshua: 754 converts an integer to a NaN

Fred: Could change strtod() to specify domain errors for "unusual" string

Jim: Should there be a note making strtod() behavior more explicit? Will hold off for now.

mid-point and linear interpolation functions

Damian: initial disc, leading to Vincent's reply, then 3146 from David ("eloquent" even) arguing it might be overkill.

David: Hard to standardize a function when not an obvious best way to accomplish it.

All: Sidebar on gamma and Bessel functions, arguably outside scope of C

David: LAPACK has a def. but that doesn't mean the language standards should.

Jim: Case where functions are "slow" in software yet unlikely to be implemented in hardware.

Joshua: Added to C++ language standard, with many good properties (though not perfect, with respect to IEEE exceptions, and others). Will check how much it's used now.

David: Suggest matching C++ syntax, not semantics

Jim: After discussion, seems there is no need for a fully specified version of the function.

lingering imaginary types

[Cfp-interest 3250] Lingering references to imaginary type Jim
Thomas

Jim: Proposal is ready to go.

All: As an additional item, the language "....return the
imaginary part value (as a real)" in the cimag functions feels redundant
(Jim) but there was support to keep the parenthetical for absolute clarity.
The issue needs more discussion.

 use of "can not"
    [Cfp-interest 3162] use of "can not" in N3301 5.2.2.4p13 Vincent
Lefevre

Jim: Issue is spilling a register without changing its value.
Suggest change to "cannot" to remove subtle ambiguity of the meaning of
"can not", in context

  range errors for ilogb and llogb
    [Cfp-interest 3202] llogb() Fred J. Tydeman
    [Cfp-interest 3228] Re: llogb() Jim Thomas
    [Cfp-interest 3266] Re: llogb() Jim Thomas

Jim: Current usage has over/underflow of just floating point
values. This conflicts with the language of ilogb() and llogb(). Suggest
removing all references to range error when the result is an integer type

Rajan: WG14 won't like "obsolescent features"

Other issues:

  None.

Adjournment

  10:04 AM PDT

Action items to be carried over:

  Jerome: Identify fadd/fsub and fma "error may occur" issues and report.

New action items:

  Jim: Update Complex suggestions (3262) for Annex G migration.

  Jim: Update frexp for double double (3154) per discussion, to leave
undefined result for non-model numbers, and submit the proposal to WG14.

  Fred: Send note to WG14 about constexper exceptional case issue.

Fred: Send nan() email to WG14 (3259).

David : Draft reply to WG14 re. midpoint and interpolation.

Jim: Submit to WG14 a proposal about lingering references to imaginary (3250).

Fred: Draft a proposal for the "cannot" vs. "can not" change (3162).

All: Please send comments to Damian by Monday 30 Sept on the first of 4 sets of proposals (3247), including comments on Jim's responses (3279).

Jim: Write up a proposal for ilogb() and llogb() (3266).

Discussion issues to be carried over:

fadd/fsub and fma "error may occur" issues

treatment of error conditions
     [Cfp-interest 3193] improving the language of 7.12.2 "Treatment
of error conditions" Jerome Coonen
changes to 6.X and 7.X
     [Cfp-interest 3247] C26 Complex Related Changes Damian McGuckin
     [Cfp-interest 3248] Re: C26 Complex Related Changes Damian
McGuckin
     [Cfp-interest 3249] Re: C26 Complex Related Changes Jim Thomas
     [Cfp-interest 3279] Re: C26 Complex Related Changes Jim Thomas
deeper TOC for annexes
     [Cfp-interest 3164] TOC depth for C annexes

Respectfully submitted.

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