C Floating Point Study Group Teleconference

2025/01/08: 8 AM PST / 11 AM EST / 4 PM UTC

Attendees
   Jim Thomas, Rajan Bhakta, Jerome Coonen, Fred Tydeman, Joshua Cranmer, Damian McGuckin, Hans Boehm, David Hough

New agenda items
   https://wiki.edg.com/pub/CFP/WebHome/CFP%20meeting%20agenda-20250108-update.pdf

Previous meeting notes
   https://wiki.edg.com/pub/CFP/WebHome/n3445.pdf

Next Meeting(s)
   12 February 2025, 8:00 AM PST
   ISO Zoom teleconference
   Please notify the group if these time slots do not work.

C documents
   There is a new C2Y draft 3435 Jan 2025. https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3435.pdf
   C23 has been published ISO/IEC 9899, available for purchase.

IEEE 754 liaison
   None.

C++ liaison
   Hans will present below.

WG14
   Next meeting is Feb 24-28.
   Robert Secord has asked if CFP would like to give a 754 revision update.
      Jim: Might be a good idea because the TS-4 and TS-5 revisions are in ballot. This is a huge milestone.
      Rajan, et al.: The request really seems to be about the revision work that has started in the last months. Given the target of 2029, it may be too early than to give more than a cursory statement about the size and activity level of the group, and some potential projects.

C23 integration
   C23 has been published. Has an October 2024 date, but referred to as C23.
   https://www.iso.org/standard/82075.html

Carry-over action items from last meeting
   David: Draft reply to WG14 re midpoint and interpolation.
      Deferred to next meeting.
      _____

   Damian: Split doc into 3 documents: complex.h intro, cproj, and editorial suggestions.
[Cfp-interest 3346] Re: The 'cproj' routine - 7.3.9.5 Damian McGuckin
      The cproj document is done and is a subject below.

Action items from last meeting

Fred: Submit SIGFPE suggestions to WG14 for comment.
N3401 2024/11/24 https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3401.htm Tydeman, SIGFPE and I/O, version 2
    Done.

   Jerome: Submit fadd, fsub, etc. domain errors proposal to WG14. (Will require help from another member actually certified to submit to WG14.)
N3404 2024/12/01 https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3404.pdf Thomas, Proposal for C2Y - Improved treatment of error conditions for functions that round result to narrow type
    Done.

   Jerome: Submit exception "occurs" proposal to WG14 (again, with support).
N3405 2024/12/01 https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3405.pdf Thomas, Proposal for C2Y - Improved wording for treatment of error conditions in <math.h>
    Done.

   Jim: Submit revised complex operators proposal to WG14.
N3406 2024/12/01 https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3406.pdf Thomas, Proposal for C2Y - complex operators, updates N3384
    Done.

   All: Continue study of the imaginary I macro and i suffix issues, noting that the I macro may be removed from C.
    Deferred, see below.

   Jim: Write a proposal for use of CMPLX to generate desired values with signed 0 and inf when using the i suffix in a context with no imaginary values, just real and complex.
[Cfp-interest 3337] https://mailman.oakapple.net/pipermail/cfp-interest/2024-December/003352.html Proposal for complex literals warning Jim Thomas
    Done, see below.

TS-4 and TS-5 revisions
   Part of WG14 discussion above.

Discussion of issues
   Fenv rounding modes
https://www.open-std.org/jtc1/sc22/wg21/docs/papers/2024/p2746r6.pdf
    Hans: C++ group view is that it's better to pass a rounding mode to a specific operation than to pass a mode to block (as suggested in 754). Looked at a few examples of the struct, A major theme is that the C++ suggestion is not very C friendly.
    Jim: Noted a simpler way to evaluate the expression in the first example.
    Hans: Not presented yet to 754 committee. Suggested it be kept in the language domain.
    Jim: Have many comments, probably better to write them up.
    Rajan: Will come down to the compatibility study group.
    Hans: Reproducible arithmetic part of the conversation.
    Joshua: C++ doesn't want pragmas, but wants templates instead. Have tried to propose, but have found resistance.
    Damian: If the templates do indeed have eleven arguments governing their behavior, then we need to look at the overhead.
    Jim: The FENV_ROUND pragma is very new, so it's too early to ask about implementation status.
    Hans: Rounding control will be via assembly snippets that change the modes, all invisible to the compiler
    Joshua: C++ implementations allow something like FENV_ACCESS on a per-function basis. (This is done via compiler extensions in all cases; the standard itself says nothing here, and only a few implementations support the FENV_ACCESS pragma itself.)

   Cproj cleanup
[Cfp-interest 3346] https://mailman.oakapple.net/pipermail/cfp-interest/2025-January/003361.html Re: The 'cproj' routine - 7.3.9.5 Damian McGuckin
    Damian: Have cleaned up the language and added some historical rationale.

Rajan: Suggest saving rationale for future reference.

Jerome: One implementation years ago actually mapped to the Riemann sphere in real 3-space. That implementation was changed to align with the current specification, which is deemed more useful, so the discussion probably need not be carried forward with the standard.

Reply to WG14 re midpoint and interpolation
David: Deferred but still in consideration.

Use of CMPLX vs complex literals for special values
[Cfp-interest 3337] https://mailman.oakapple.net/pipermail/cfp-interest/2024-December/003352.html Proposal for complex literals warning Jim Thomas
Rajan: Proposed removing reference to "execution time", but after discussion withdrew.
All: Discussion of other instances of execution time.

Imaginary I
Jim: Will keep on the agenda.

Other issues:
Special cases for cpow
[Cfp-interest 3332] https://mailman.oakapple.net/pipermail/cfp-interest/2024-November/003347.html special cases of cpow Paul Zimmermann
[Cfp-interest 3336] https://mailman.oakapple.net/pipermail/cfp-interest/2024-December/003351.html Re: special cases of cpow Jim Thomas
Jim: No reply yet to response to Paul Z. so deferred for now.

glibc math functions
[Cfp-interest 3339] https://mailman.oakapple.net/pipermail/cfp-interest/2024-December/003354.html Fwd: More C23 math functions in glibc Jim Thomas
Jim: Good news that GNU glibc is now supporting cospi, sinpi, and tanpi.

Adjournment
9:25 AM PST

Action items to be carried over:
David: Reply to WG14 re midpoint and interpolation

Damian: Split doc into 3 documents: complex.h intro, cproj, and editorial suggestions.

New action items:
Damian: Prepare cproj proposal for WG14.

Jim: Submit n3352 related to complex literals to WG14.
Rajan: OK to base on n3301 for now. Later, will move to the new draft.

Discussion issues to be carried over:
Imaginary I

Respectfully submitted.

Changes for Rev. 1:
• Add Rajan to attendees. Use full names.
• Drop "Do not distribute." from C2Y draft.
• Edit Joshua's statement on FENV_ACCESS.
• Refine Jerome's comment about an historical cproj mapping the the true Riemann sphere.
• Add Damian's comment about overhead in templates to handle rounding control.
• Fix several minor typos.

Changes to Rev. 2:
- Add Damian's action to the carry-over list.
- Typo in C23 purchase note.

-Jerome Coonen
 650.996.4738
 jcoonen@gmail.com