WG14 N3729
Meeting notes

C Floating Point Study Group Teleconference

2025/10/15: 8:00 AM PDT/3:00 PM UTC
[Please submit proposed changes to these minutes to Jerome or to the group. Revision changes appear at the bottom.]

Attendees

Jim Thomas, Rajan Bhakta, Jerome Coonen, Damian McGuckin, David Hough, Tue Ly, Joshua Cranmer, Eskil Steenberg Hald

Updated agenda plus new items

https://wiki.edg.com/pub/CFP/WebHome/CFP meeting agenda-20251015-update.pdf – These minutes should be read alongside the agenda, with its many reference links.

Previous meeting notes

https://wiki.edg.com/pub/CFP/WebHome/n3725.pdf

Study group logistics

Next meeting: 29 October 2025, 8:00 AM PDT/3:00 PM UTC
Final 2025 meeting 12 November 2025, 8:00 AM PST/4:00 PM UTC
ISO Zoom teleconference
Please notify the group if this time slot does not work.

C documents

The latest C2Y draft is N3685 Sept. 2025 https://www.open-std.org/jtc1/sc22/wg14/www/docs/n3685.pdf
C23 has been published ISO/IEC 9899, available for purchase. https://www.iso.org/standard/82075.html

IEEE 754 liaison

David: Making gradual procedural progress.

C++ liaison

Joshua: Next meeting first week of Nov. Two papers on floating point topics: defining fastmath semantics is hard and reproducibility.

WG14 update

Rajan: Next meetings 2-6 Feb 2026.

TS-4 and TS-5 revisions

None.

News

Jerome: (a) The 754 chair announced an invitation-only 40th anniversary event for 754 on 1 Nov in Berkeley, at the site of the IEEE Milestone plaque dedicated May 2023. (b) The IEEE Milestone plaque for the Intel 8087 Math Coprocessor was finally dedicated on Haifa, Israel. It was delayed over a year by the troubles there. (c) The Computer History Museum has just posted the oral history of Ravi Nave's work as leader of the silicon design team for the 8087. Jerome will send a note to the 754 and CFP groups.

Carryover action items from last meeting

None

Action items from last meeting

Jim & Rajan: Send email to WG14 seeking direction for how to deal with translation time evaluation of constant expressions that does not lead to possible undefined behavior.

Done

Jim & Rajan: Craft note to Alex, CC to WG14, re. n3584, removing imaginary I.

Done

Jerome: Draft a proposal re. the language of functions returning the principal value.

Done

Jim & Jerome: Look further into the language around when errors "occur" in the sense of C2Y and how the setting of errno fits in. Draft a proposal, if appropriate.

In progress, carry over

Discussion of issues

Floating expression evaluated in the translation environment

Rajan: Action was to remove undefined behavior. Remove the occurrence of "shall" that allows UB, noting that the translation environment knows the bounds of range and precision of the execution environment. Action to submit.

Removing imaginary I

Rajan: Alex has not responded to note but the topic will arise in the next WG14 meeting. No further action now.

TOWARDS and missing quotes issues

Jim: These are addressed in the latest C2Y draft. Closed.

Error handling in TS-5

Jim: Joseph has updated WG14 Issue 1014 to record the proposed correction and its acceptance (when TS-5 is ever updated). No further action.

Output bounds for math functions

Jerome: Jim dug into this after previous meeting, doing the lions share of the action. This brings the language of C2Y in line with 60559 and removes a conflict with correctly-rounded implementations. Action to submit.

Special cases of cpow

Jim: Paul Z. sent email about this, requesting guidance on handling of special cases. Jim and Paul have corresponded. This is a request for information, not a request for action.

Preferred quantum exponent for nextafterdN

Jim: Fred brought up the situation of quantum exponents for “returns y when x equals y". Jim proposes language along the line "returns the numerical value of y when x equals y” with reference to Table 5.2 for the preferred quantum exponent. Action.

Annex F changes discussion paper

Damian: Reviews several specific items. Removing the comma introducing compound cases "for x < C n y > 0" would be consistent with other C2Y usage. Use the singular form "integer n". A big issue is the choice between single-ended and double-ended bounds for domains.

Jim: The standard doesn't use ranges but uses constraints like "0 < x".

Damian: Looks at atan2() cases as an example. Is "finite y > 0" better than "0 < y < +inf"? Is "y > 0" better than "0 < y <= inf", given that inf is assumed to be part of the augmented reals? Then compare cases from tanpi(), with language like "evn n > 0". Here the modifier "even" is all but required.

Ly: Proposes calling out all the inf cases and having "x" always be finite.

Rajan et al.: That is too large a change.

Damian & Jerome: Annex G is complicated enough to require explicit statements of bounds. But does Annex F have to be expressed just like G? The audience for F is wider and may benefit from the simpler, more concise language that can work for F but not G.

Damian: Will do two versions, with "finite" and with bounds.

F.3 #7 quiet/signaling NaNs

Jim: Annex F specifies optional support for signaling NaNs, but the specification doesn’t cover the signbit macro. The signbit macro is one of a family of operations not sensitive to signaling NaNs.

Jerome: Take action to find the macros and functions that handle all nans silently.

Encode/decode in TS-4

Damian: Forwarded Michel's message re. 60559 because it's already in Annex H.

Jim: No action.

Overflow, non-default rounding, errno

Action carried over.

F.10.9.1 - nextafter(x, y)

Damian & Jim: There is an issue of the language of the return value of a function. Using simple "result" can be ambiguous.

Eskil: "Function value" might be misinterpreted as a pointer to the function.

Jim: Take action to write a note about what to do.

strtodN clarification

Jim: Fred raised the issue of clarifying the type the conversion is rounded to.

Jerome et al.: Does not seem to be ambiguous.

Rajan: Proposes adding to low-priority list. Action for Jim.

Other issues

None.

Adjournment

10:02 AM PDT

Action items to be carried over

Jim & Jerome: Look further into the language around when errors "occur" in the sense of C2Y and how the setting of errno fits in. Draft a proposal, if appropriate.

New action items

Rajan: Submit the proposal regarding translation time expression evaluation.

Jim: Submit the proposal regarding output bounds for math functions.

Jim: Draft a proposal for the language of quantum exponent in nextafterdN.

Damian: Draft Annex F change proposal in two flavors, with modifiers and with double-ended bounds.

Jerome: Follow up on 3618 to see whether snan issues apply to more than signbit, and what to do about it.

Jim: Write a note about the locution of "result" vs. "result value" vs. "return value" in some problematical functions where the language is not best today.

Jim: Add strtodN to list of low-priority issues.

Discussion issues to be carried over

F.10.1#14

Rounding modes, terminology

canonicalize() in AnnexF - F.10.9.7

hypot(x, y) - C2Y F.10.5.4

hypot(x, NAN) in Annex F

Magnitude or Absolute Value or |x| or ....

Preferred Style in Annex F - fromfp/fromfpx or nearbyint/rint

Consistency in paragraphs using NaNs

The nan functions

Occurs vs shall occur for math errors

Floating-point function or function returning a floating-point result

SNAN macro location change

Signoff

Respectfully submitted.

-Jerome Coonen
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