

WG14 N3237

Meeting notes

C Floating Point Study Group Teleconference

2024-03-13

8 AM PDT / 11 PM EDT / 3 PM UTC

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

New agenda items

(<https://wiki.edg.com/pub/CFP/WebHome/CFP%20meeting%20agenda-20240313-update.pdf>):

None.

Previous meeting notes:

See CFP3001 (<http://mailman.oakapple.net/pipermail/cfp-interest/2024-February/003015.html>).

Next Meeting(s):

April 10, 2024, 3PM UTC

ISO Zoom teleconference

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

New action items:

Rajan: Send the WG14 editorial comments from CFP to CFP.

Rajan: For C2Y issue 5, reword H.3.6 and 5.2.5.3.2#28 to "If a signaling NaN macro (optionally preceded by the unary + or - operator) is used for initializing an object of the same type that has static or thread storage duration, the object is initialized with a signaling NaN value."

Jim: Fix the suggested changes section in CFP3020's paper to point to N3219 (instead of the incorrect N3619 as it currently is) and send it out to WG14.

Jim: Submit the paper resolving C2Y Issue 17 (CFP3022) to WG14.

Jim/Jerome/Damian: Follow up on C26 issue 1.

Fred: Add CFP3003 to the issues list.

Jim: Draft up changes to incorporate CFP3006.

Fred: Add CFP3007 to the C26 issues list.

Damian: Get a list of editorial issues in Annex G and send them out for future submission to WG14.

Action items to be carried over:

None.

C++ liaison:

None.

WG14 (added):

See CFP3008 and follow ons.

No editorial review group resolution meeting scheduled yet.

Next WG14 meeting (virtual) is June 10-14th, 2024.

^Rajan: Send the WG14 editorial comments from CFP to CFP.

C23 integration

C23 drafts:

C23 working draft n3219 - July 2, 2023 - For CFP review only. Do not distribute.

Carry over action items

None

Action items from previous meeting (Done unless stated otherwise)

Fred: C26: Issue 5: Are there any $\langle\text{math.h}\rangle$ macros with the same issue? Should words be added to an introduction section in $\langle\text{float.h}\rangle$?

See [Cfp-interest 2999] $\langle\text{math.h}\rangle$ macros and exceptions (and follow on CFP 3031)

OK with using CFP 3031 as the direction for the resolution to the issue.

Jim: For SNAN macro recommended practice (in F.2.2#6 on), don't see the issue.

Fred: Will look at it.

Rajan: The H.3#6 should have the optional unary operator be after the initializing an object to not make that optional mandatory (in a specific way of reading it).

Jim: I'm OK with that.

Jerome: Doesn't adding the -/+ cause raising a signal?

Jim: No, this is not an expression. 754 has a set of operations that do not signal.

Damian: Yes, that's true.

Jim: Things like copysign.

Damian: Other operations like Abs, Negate and Copy as well. (Post meeting reference: IEEE 753 5.5.1).

^Rajan: For C2Y issue 5, reword H.3.6 and 5.2.5.3.2#28 to "If a signaling NaN macro (optionally preceded by the unary + or - operator) is used for initializing an object of the same type that has static or thread storage duration, the object is initialized with a signaling NaN value."

Fred: C26: Issue 9: Look at original CFP messages to see if 3.10 (Correctly rounded definition) might cover it.

See [Cfp-interest 3000] CFP issue #9

Fred: Fine with it.

Rajan: It is in 3.12 in N3219.

Jim: C26: Issue 4: Draft a paper as per the resolution in the issues list.

See [Cfp-interest 3020 and follow ons] Re: printf and rounding recommendation

^Jim: Fix the suggested changes section in CFP3020's paper to point to N3219 (instead of the incorrect N3619 as it currently is) and send it out to WG14.

Jim: C26: Issue 17: Draft a paper as per the resolution in the issues list.

See [Cfp-interest 3022] C2Y Issue 17

^Jim: Submit the paper resolving C2Y Issue 17 (CFP3022) to WG14.

Jerome: C26: Issue 1: Get definitions of terms relating to the issue for 754 and C and regular math.

See [Cfp-interest 3016] Re: about C26 Issue 1

Jerome: Will need to remain an open issue until we get closure from the 754 people. We could make the changes I suggested in C, but better to wait for 754.

Jim: The 754 term we need to be consistent with is the divide-by-zero exception. It doesn't classify the different types of errors. C needs the categories due to errno.

Damian: I think singularity is exactly what you want.

Fred: So $\log(0)$ is a singularity error?

Jerome: Yes, on 754 systems.

Fred: If you make this change for $\log \gamma$, you need to do it for all other cases like $\log(0)$.

Jerome: Yes, I think you are right.

Jim: Wider issue, see CFP-2996.

Fred: Don't most mathematicians consider $\text{pow}(0,0)$ to be 1?

Damian: Yes.

Jim: No. Because the limit does not exist.

David: It's an exception since there is no right answer. The default is arbitrary. You should get an exception for $\text{pow}(0,0)$. I had forgotten that.

Joshua: All the `pow`, `powr`, and `powf` say they return 1 without exceptions in IEEE.

Jerome: I think some people wanted NaN since it is dangerous to say anything since 0, 1, or infinity are all valid.

Jim: Kahan said you had to have 1 as anything else would cause problems.

Jim: Now I'm thinking of leaving "mathematical function" as not fully defined.

Jerome: My sense of IEEE is that they don't like the calculus idea of infinity, but more the computation based numerics. If there is no language in the C standard to talk about the mathematical domain that lurks behind everything, then it would be hard to introduce it without a lot of work. And instead talk about the computer arithmetic domain.

Jim: The mathematics is definitely behind it. Like the discussion of poles, and `log` referring to the mathematical log functions.

^Jim/Jerome/Damian: Follow up on C26 issue 1.

TS-4 and TS-5 revisions

See [CFP 3015]

Jim: For TS-4, the use of "consider" is not accepted by ISO. The example for `scaled_proddiff`, we can say "The following computes a fragment of the Clebsch-Gordan calculation as a simplified example." instead.

Jim: For augmented arithmetic, an example has moved to 7.2. This makes it a more ISO conforming way of referring to the example.

C26 issues

Issues list

See <https://wiki.edg.com/pub/CFP/WebHome/C26C.HTM>

See [CFP 2992, 2994, 3003, 3005 and follow ups]

Jim: CFP3003 should be added to the issues list.

^Fred: Add CFP3003 to the issues list.

Jim: For CFP3006, Vincent has better words for inputs.

Rajan: This would change the "correctly rounded" with respect to inputs.

Jim: Yes, correct. We'd have to do that too.

^Jim: Draft up changes to incorporate CFP3006.

Jim: Similar for CFP3007. This issue there is he is saying infinity is a floating-point number, but it is not, at least how we have defined it.

^Fred: Add CFP3007 to the C26 issues list.

Issue 1: In progress (Jerome's item).

Issue 3: Jim: I have this as no need for change and closed.

Issue 4: Jim: Have a draft proposal for this. Action item.

Issue 9: Jim: We decided we could close this.

Issue 17: Jim: Have a draft proposal for this. Action item.

Jim: Propose we look at 11 and 14 next.

Imaginary types

See [N3206, CFP 2979, CFP 2997 and follow ups]

Annex G complex functions

See [CFP 3018, 3019, 3032, and follow ups]

Damian: Noticed some inconsistencies in Annex G.

Damian: CFP3037 has a summary of inconsistencies that are mostly editorial.

^Damian: Get a list of editorial issues in Annex G and send them out for future submission to WG14.

Others?

Other issues

IEEE 754 meetings

Damian, David, Jerome are attending. (Mike attended the first meeting, and will again if requested).

Fred: IEEE explicitly asked for James Thomas for language input.

Accuracy of mathematical functions

See [CFP 3002]

Fred: Not very good at setting the flags.