WG14 N2195
Meeting notes

C Floating Point Study Group Teleconference

2017-11-14
9 AM PST / 12 PM EST

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

New agenda items:
Fred's email discussion.

Last meeting action items:
Jim: Activities: Add in WG14 document numbers to the items that have them. - Done
Rajan: %a precision: If the footnote is wanted by WG14, correct the typo (differs is several ways -> differs in several ways) - Done (editorial discretion)
Rajan: %a precision: If the footnote is wanted by WG14, change "For example" into "For instance" - Done (editorial discretion)
Jim: Respond to WG14 reflector message 14812 with the need to have it predictable and fixed - Done (Sent October 19th)
Jim: Send WG14 N1361 to the CFP group - Done (October 18th email)
Ian: See if there is an incompatibility between C and C++ for constants being evaluated to a wider format (Ex. FLT_EVAL_METHOD affects constants in C++, and wider return values) - In progress (Hubert: Not defined and left up to C)
Rajan: Willem's paper point 4 (return value): No consensus but are OK with either way and if no change, we should note that function return format is not being affected by FLT_EVAL_METHOD - Done
Fred: Get the latest C standard paper to the group - Done (Sent email to the password protected paper, to resend)
All: Discuss via email Fred's email on 2017/09/21 about Annex F the TS. Potential DR for part 1. - To do today
Jim: Send out alternate proposal incorporating Willem's points this group agrees on. - Done (N2186)

New action items:
Jim: tgmath_for_narrowing_functions (DR13, part 3): Need to bring in functions that cover three arguments.
Jim: tgmath_for_narrowing_functions (DR13, part 3): Rewording for the f32mul example.
Jim: Create a new paper along the lines of tgmath_for_narrowing_functions proposing a new TC for CFP DR13.
Jim: Write a DR addressing WG14 reflector message 14885 using the email sent by Jim on 2017/11/13.
Fred: Look through the new functions and see what is missing in Annex F.
Fred: Follow up with inconsistencies in Infinities references in function descriptions in our TS via email.
Fred: Look into 754:2018 4.3.1 (roundTiesToEven) applies to us for string conversion (printf for example).
Jim: Update the binding table in parts 1 and 2 to handle the new IEEE-754:2018 functions when published.
David H: Look into the consistency with our TS and IEEE-754:2018 for 5.3.2, 9.2, 9.2.1, 9.2.2 and 9.4.
Jim: Update activities list (http://wiki.edg.com/pub/CFP/WebHome/in_flight-20171004.pdf) with new status (LaTeX integration) and items (consistency with 754:2018 draft, special cases in Annex F).

Next Meetings:
January 9th, 2018, 12:00 EST, 9:00 PST

Same teleconference number.

Discussion:

IEEE 754 revision:

Almost done.

totalOrder issues - Cost at least a month or two. This is for binary non-basic formats with canonical and non-canonical representations for the same NaN. The difference is if getpayload should decode the significand or just report it as a bitfield.

Ian: Implementations can give their own decode function.

Change for augmented precision which will cause a change for our proposal (rounding method).

C++ liaison:

Nothing new.

WG14 Meeting:

N2172: Major issue for rejection was performance.

N2186 will be added to SD3.

DR12: Good the way it is. No changes needed.

DR's: Not a defect according to ISO rules. Our DR's will become Clarification Requests or something else ("Issues" like C++?). There may be a respository to track these as well.

Fred: The standard has been converted to LaTeX and in git. We can start adding part 1 and 2 to the standard (as a branch).

Email Issues:

J Myers (SC22WG14.14879) Floating-point DR#13 and integer arguments to type-generic macros

Need to fix these.

Jim's 2017/11/13 email (tgmath and narrowing functions) was found when looking at these.

Undefined behaviour gives most flexibility and easiest fix.

No portable way to do fadd for _Float32X with long double.

http://wiki.edg.com/pub/CFP/WebHome/tgmath_for_narrowing_functions.pdf

*Jim: tgmath_for_narrowing_functions: Need to bring in functions that cover three arguments.

*Jim: tgmath_for_narrowing_functions: Rewording for the f32mul example.

J Myers (SC22WG14.14885) Comparison macros and usual arithmetic conversion

Jim's email on 2017/11/13 looks good.

We never meant for comparisons for things that are not comparable.

*Jim: Write a DR addressing WG14 reflector message 14885.

Freds email re Annex F (2017/9/21):

Jim: I don't think we itemize anything for sqrt

Fred: I think we do in the existing C99!

Jim: I think it says sqrt is fully specified in 60559.

Jim: We need to review Annex F for all the new functions. Nothing substantive since we have already made the specification by reference.

We figured C standard readers didn't want to cross reference 754 all the time.

Note that we didn't do that for totalOrder (we referred to 754).

*Fred: Look through the new functions and see what is missing in Annex F.

Fred: Should the main body of the standard call out exception cases to Inf?

Jim: Infinity is not part of the basic model in the C standard.

Fred: fmul for example lists domain error for INF and 0. fadd and fsub do not say it for infinities of different signs. I suggest we add words to say it should have a domain error. Jim's response was we shouldn't do that since we don't normally do it in the C standard (with a few exceptions, including where it is essential to the function) and the TS should be consistent with C.

Fred: There are inconsistencies that should be fixed in the TS. Will follow up in email.

Binding for IEEE 754-2018:
Augmented: Mostly stable.
Min/Max: Stable.
Payload: Waiting for it to be stable in 754.

Email on 2017/11/14 from Jim (Changes in 754):
4.3.1 (roundTiesToEven) applies to us for string conversion (printf for example).
*Fred to look into this.
5.3.1 (preferred exp): Already have it.
5.3.1 {min,max}Num{Mag}: Already covered with our new proposal. Need to update the binding table in parts 1 and 2.
*Jim: Update the binding table in parts 1 and 2 to handle the new IEEE 754 functions when published.
5.3.2 (quantum operation): Need to check for consistency
*David H. to look into this.
5.7.1 (predicate operation): Not in C. We do have references to 60559:2011. These need to change to 2018.
60559 last time had a 3 year delay from the IEEE-754 standard.
We have macros that are defined with the value of a date that refers to the TS timing, not 60559.
Just need to track it.
9.2 (new aSinPi, aCosPi): Present in part 1. Added to IEEE based on our spec. Need consistency check.
*David H. to look into this.
9.2.1 (new cases for pow): Present in part 1. Added to IEEE based on our spec. Need consistency check.
*David H. to look into this.
9.2.2 (preferred exponents): Consistency check.
*David H. to look into this.
9.4 (inexact exception): Consistency check.
*David H. to look into this.
9.5 (new augmented functions): Covered already.
9.6 (new min/max functions): Covered already.
9.7 (new get/set/setsignaling payload operations): Covered.

Activities (http://wiki.edg.com/pub/CFP/WebHome/in_flight-20171004.pdf):
1, 2) Look at the LaTeX version of the document and into integrating the DR's.
3-5c, TONEARESTFROMZERO) Update for next WG14 meeting.
cbrt example) Need to invite Clark to the next CFP meeting.
Updating to 754:2018, augmented, min/max, payload) Wait for publish before we present this.
Willem's issues) Wait for Willem's reponse.

New item: Checking consistency with 754:2018 draft.
New item: Filling in special cases in Annex F.
Possible new item: Fred's consistency check for Infinities specification.
*Jim: Update activities list with new status.

We could update part 1, 2, etc. with the closed DR's and use them as the base document for WG14 to look at when considering inclusion into C2X.

Other:
None.