Proposal for C2x
WG14 N2079

Title: TS 18661-2
Author, affiliation: C FP group
Date: 2016-09-10
Proposal category: New features
Target audience: Financial, commercial, and user-centric applications and web services

Abstract: This proposal incorporates the changes specified in ISO/IEC TS 18661-2 into C2x. C currently supports the 1989 version of the IEC 60559 standard. The changes specified in TS 18661-2 add the required features for decimal floating-point arithmetic in the current IEC 60559 standard (2011). (Other parts of TS 18661 support binary floating-point arithmetic and optional features in the floating-point standard.) The current IEC 60559 standard treats binary and decimal arithmetic with equal emphasis, with most features applying similarly to both; an implementation may conform to the floating-point standard by providing binary or decimal arithmetic (or both). The changes to C specified in TS 18661-2 add decimal types, decimal analogs of the features for binary arithmetic, and a few features specific to decimal arithmetic. TS 18661-2 supersedes ISO/IEC TR 24732:2009, *Extension for the programming language C to support decimal floating-point arithmetic.*

Dependency: TS 18661-1

Prior art: A number of features from TS 18661-2 have been implemented in some form already. Examples are listed below:

GCC, HP, IBM, Intel: DFP types, preferred quantum exponents, conversions, constants, (all to the extent of TR 24732:2009)

GCC, HP, IBM: New macros, (all to the extent of TR 24732:2009)

HP, Intel, IBM: Decimal operation binding (examples include quantized*, convertFormat, samequantumd*) and other functions corresponding to standard functions (examples include fma, sqrt, fabs, acosd*, frexpd*) (all to the extent of TR 24732:2009)

IBM: Rounding functions (different names)

HP, IBM: format specifiers, type generic macros for decimal functions

HP, Intel: Evaluation format types, encoding/decoding functions (all to the extent of TR 24732:2009)