

Proposal for C2x
WG14 N2117

Title: TS 18661-3 interchange and extended types
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Date: 2017-03-05
Proposal category: New features
Target audience: Data exchange, robust computation

Abstract: This proposal incorporates support for the IEC 60559-recommended interchange and extended floating-point formats into C2x, as prescribed in ISO/IEC TS 18661-3. The proposal includes fully supported types for the arithmetic interchange and extended formats in the current IEC 60559 floating-point standard (2011). It also includes conversions for data in the floating-point standard's non-arithmetic interchange formats. The proposal enables implementations to support any of an unbounded tower of formats for exchanging floating-point data and to support formats that are suitably wider than the basic IEC 60559 formats, for robust computation.

Prior art: GCC supports `_FloatN` and `_FloatNx` types (including with `_Complex`) on multiple systems. Several C implementations have provided additional floating-point types as extensions. For examples, HPUX C/C++ has a fourth type, with an IEC 60559 double64-extended format, and LCC supports `float128_t` and `qfloat`.