TS 18661 DR 15

Reference Document: TS 18661-3

Subject: Characteristic macros for non-arithmetic formats

Summary

This DR addresses an issue related to DR 501 and IEC 60559 non-arithmetic interchange formats.

TS 18661-3 attempted to change the definition of DECIMAL_DIG so that it would apply to all supported IEC 60559 formats. DR 501 shows that this change is problematic. After several unsuccessful attempts at a suitable TC, WG 14 and the CFP group have agreed to obsolesce DECIMAL_DIG in favor of the type_DECIMAL_DIG macros.

The type_DECIMAL_DIG macros are helpful in using conversions between binary floating-point formats and decimal character sequences. TS 18661-3 specifies such conversions for non-arithmetic binary interchange formats, but neglects to include the macros for such formats.

Likewise, the type_DIG macros too are helpful in using conversions between binary floating-point formats and decimal character sequences, though TS 18661-3 does not specify them for non-arithmetic formats.

The suggested TC below extends the set of FLT_N_DECIMAL_DIG and FLT_N_DIG macros to include ones for IEC 60559 non-arithmetic binary interchange formats.

Suggested Technical Corrigendum

In TS 18661-3 5.3, in the text for 5.2.4.2.2#6c, after the list for supported types _FloatN, insert:

for IEC 60559 non-arithmetic binary interchange formats of width N:

    FLT_N_DECIMAL_DIG    FLT_N_DIG

In TS 18661-3 clause 7, in the text for 5.2.4.2.2a#1, change:

    The prefix FLT_N_indicates a binary interchange floating type of width N.

to:

    The prefix FLT_N_indicates a binary interchange floating type or a non-arithmetic binary interchange format of width N.
Change the last sentence of 5.2.4.2.2a#1 from:

Conversely, for each such type that the implementation does not provide, <float.h> shall not define the associated macros in the following lists.

to:

Conversely, for each such type that the implementation does not provide, <float.h> shall not define the associated macros in the following list, except, the implementation shall define the macros FLT_N_DECIMAL_DIG and FLT_N_DIG if it supports IEC 60559 non-arithmetic binary interchange formats of width N by providing the encoding-to-encoding conversion functions in <math.h> and the string-to-encoding and string-from-encoding functions in <stdlib.h>.