

# **The New C Standard** (Excerpted material)

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**An Economic and Cultural Commentary**

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## 5.2.4.2 Numerical limits

numerical limits An implementation is required to document all the limits specified in this subclause, which are specified in the headers `<limits.h>` and `<float.h>`. 300

### Commentary

Telling developers to look at the contents of the headers `<limits.h>` and `<float.h>` could well suffice as documentation.

### C90

*A conforming implementation shall document all the limits specified in this subclause, which are specified in the headers `<limits.h>` and `<float.h>`.*

### C++

18.2.2p2 Header `<climits>` (Table 16): . . . The contents are the same as the Standard C library header `<limits.h>`.

18.2.2p4 Header `<cfloat>` (Table 17): . . . The contents are the same as the Standard C library header `<float.h>`.

### Other Languages

Many languages provide no means of obtaining such information about an implementation. The size of all scalar data types is predefined in Java. There are no implementation decisions to be made. The Java classes—`java.lang.Character`, `java.lang.Integer` and `java.lang.Long`—contain members giving minimum and maximum values of those types. There is no such class for the type **short**.

### Common Implementations

There are two main kinds of implementations. Those in which **int** is 16 bits and those in which **int** is 32 bits. A third kind might be added, those in which **int** is not one of these two values (24 and 40 have been used). Processors supporting 128-bit integer types, where **int** might naturally be 64 bits, are beginning to appear.<sup>[1]</sup>

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Additional limits are specified in `<stdint.h>`. 301

### Commentary

This header contains declarations of integer types having specified widths, along with corresponding limits macros.

### C90

Support for these limits and the header that contains them is new in C99.

### C++

Support for these limits and the header that contains them is new in C99 and is not available in C++.

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**Forward references:** integer types `<stdint.h>` (7.18). 302

# References

1. AMD. *AMD64 Architecture Programmer's Manual Volume 1:*

*Application programming.* Advanced Micro Devices, Inc, 3.09 edition, Sept. 2003.