Business Plan and Convener's Report

ISO/IEC JTC 1/SC 22/WG 14 (The Programming Language C)

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1. MANAGEMENT SUMMARY

1.1. JTC 1/SC 22/WG 14 STATEMENT OF SCOPE

Development and maintenance of ISO/IEC Standards related to the programming language C.

1.2. PROJECT REPORT

1.2.1. COMPLETED PROJECTS

JTC 1.22.20.01 – Programming Language C (Revision of ISO/IEC 9899:1999), this project was delivered by the publishing of ISO/IEC 9899:2011.

JTC 1 NP 18037, Extensions for the programming language C to support embedded processors. This is a Technical Report type II.

JTC 1 NP 19769, Specification for Additional Character Data Types to the Programming Language C. This is a Technical Report type II.

JTC 1 NP 24731, Extensions to the C Library, — Part I: Bounds-checking interfaces. This is a Technical Report type II.

JTC 1 NP 24731, Extensions to the C Library — Part 2: Dynamic Allocation Functions. This is a Technical Report type II.

JTC 1 NP 24732, Extensions for the programming language C to support decimal floating point arithmetic. This is a Technical Report type II.

JTC 1 NP 24747, Extensions for the C Standard Library to Support Mathematical Special Functions. This is an International Standard.

JTC 1 NP 17961, *C Secure Coding Rules*. This is a Technical Specification.

JTC 1 NP 18661-1, *Floating-point extensions for C – Part 1: Binary floating-point arithmetic*. This is a Technical Specification.

JTC 1 NP 18661-2, *Floating-point extensions for C – Part 2: Decimal floating-point arithmetic*. This is a Technical Specification.

JTC 1 NP 18661-3, *Floating-point extensions for C – Part 3: Interchange and extended types.* This is a Technical Specification.

JTC 1 NP 18661-4, *Floating-point extensions for C – Part 4: Supplementary functions.* This is a Technical Specification.

JTC 1 NP 18661-5, *Floating-point extensions for C – Part 5: Supplementary attributes*. This is a Technical Specification. (Published date 2016-08-11)

JTC 1 TS 17961:2013/COR 1, *C Secure Coding Rules.* This is a Technical Corrigendum for a Technical Specification. (Published date 2016-08-09)

1.2.2. PROJECTS UNDERWAY

JTC 1 NP 21938-1, *Programming language C — Extensions for parallel programming — Part 1: Thread-based parallelism.* This is a technical specification.

1.2.3. CANCELLED PROJECTS

None over this period.

1.2.4. COOPERATION and COMPETITION

Where appropriate, WG 14 has established active liaisons with other SC 22 working groups. A category C liaison has been established with the MISRA C working group. There is no apparent direct competition with any other current SC 22 working group.

2. PERIOD REVIEW

2.1. MARKET REQUIREMENTS

WG 14 is responding to the C user community concerns and to the C implementers' issues. The ISO/IEC 9899:1999 standard was updated ahead of

published schedule, in 2011. The ISO/IEC 9899:2011 standard answered many concerns and keeps the International Standard for the C programming language current.

The publication and maintenance of TS 17961 addresses important security issues that affect the entire C community. The document is in active use in the industry, and resulting valuable feedback has led to a Technical Corrigendum. WG 14 has created a new Study Group to investigate the possibility of further updating this document based on feedback from the community.

WG14 has completed publication of all five parts of TS 18661. This is a C binding to the new IEEE Floating-point standard.

WG 14 is currently developing a new multipart Technical Specification to address extensions to the C programming language to provide further support for parallel programming.

WG 14 is currently working on how best to deal with the mandated ISO (Live Link/Open Text) e-committee package.

2.2. ACHIEVEMENTS

- WG 14 continued to process defect reports logged against 9899:2011 and TS 18661 parts 1-4.
- WG 14 published the Technical Specification 18661 part 5.
- WG 14 published a Technical Corrigendum for TS 17961, and formed a new Study Group to investigate updating the TS based on community feedback.
- WG 14 has a study group to study approaches to adding parallel programming to the language, and is working on a new multipart Technical Specification in this area (TS 21938).
- WG 14 has incorporated ISO e-committee into its workflow, and is committed to making this system work.

2.3. RESOURCES

WG 14 meets two times per year in co-located technical sessions with the US Task Group INCITS PL22.11. Over the past several years, WG 14 has timed at least one of its yearly technical sessions to coincide with WG 21, allowing those technical experts that would like to attend both technical sessions the opportunity to do so without undue travel. The WG 14 Convener would like to thank the WG 21 Convener for the extended effort it takes to coordinate meetings adjacent in time, and often common meeting locations, as well as liaison between the two working groups.

Last year and this year, WG 14 and WG 23 timed their April meetings to coincide with each other, which facilitates security-related discussions across the committees. The WG 14 Convener would like to thank the WG 23 Convener for his extended coordination effort as well.

Over the last several years WG 14 has made Web conferencing capabilities available for those that are finding it difficult to travel. WG 14 would like to thank ISO for the Web conferencing support.

In past years, fifteen countries have participated by attending these meetings or by being involved in the technical discussions that take place over the e-mail reflector. The countries are: Australia, Canada, Denmark, France, Germany, Italy, Ireland, Japan, the Netherlands, Norway, Russia, Spain, Sweden, the UK, and the US. However, with the new system mandated by ISO, only five of the fifteen will be able to participate: Canada, Denmark, Italy, the UK, and the US.

WG14 liaison appointments are:

Group	Name/Type	Person(s) assigned
WG 21	C++	Group liaison assigned[1]
FSG	Free Standard Group	Nick Stoughton
WG 23	Vulnerabilities	Clive Pygott
MISRA-C	Category-C Liaison	Andrew Banks

3. FOCUS NEXT WORK PERIOD

WG14 will focus on:

- Studying parallel programming, and developing a multipart Technical Specification on the subject.
- Discussing potential future improvements to the security of C, such as in Annex K, Bounds-checking interfaces, and in updating TS 17961.

The Committee has discussed several other possible new work items for the future.

3.1. DELIVERABLES

TS 21938-1 as described in1.2.2.

3.2. STRATEGIES

WG14 believes that routine handling will suffice to complete the progress desired.

3.3. RISKS

A decrease in participation due to being forced to comply with a mandate from ISO, see JTC 1/N 12032.

3.4. OPPORTUNITIES

None.

3.5. WORK PROGRAM PRIORITIES

WG 14 will work toward the publication of Technical Specification 21938 part 1.

[1] Intel, Oracle, Plum Hall, and Perennial.

4. OTHER ITEMS

4.1. POSSIBLE ACTION REQUESTS AT FORTHCOMING PLENARY

WG 14 requests permission to publish a minor revision to ISO/IEC 9899:2011 based on feedback from the C community.

4.2. PROJECT EDITORS

The following individuals have been appointed project editors and backup project editors:

JTC 1.22.20.01, *Programming Language C (Revision of ISO/IEC 9899:2011)*
Larry Jones (Project Editor), Jens Gustedt (Backup Project Editor).

JTC 1 NP 18037, *Extensions for the programming language C to support embedded processors*.
Willem Wakker (Project Editor)

JTC 1 NP 19769, *Specification for Additional Character Data Types to the Programming Language C*.
None. Incorporated into the C standard and not intended to be maintained.

JTC 1 NP 24731, *Extensions to the C Library – Part I: Bounds-checking interfaces*
None. Incorporated into the C standard and not intended to be maintained.

JTC 1 NP 24731, *Extensions to the C Library – Part 2: Dynamic Allocation Functions*.
David Keaton (Project Editor)

JTC 1 NP 24732, *Extensions for the programming language C to support decimal floating point arithmetic*
Edison Kwok (Project Editor)[2]

JTC 1 NP 24747*, Extensions for the Standard Library of the Programming Language C to Support Mathematical Special Functions*
David Keaton (Project Editor)

JTC 1 NP 17961, *C Secure Coding Rules*
Robert Seacord (Project Editor)[3]

JTC 1 NP 18661, parts 1-5, *Floating-point extensions for C*
James Thomas (Project Editor)

[2] Currently not listed in the ISO global directory.
[3] Currently not listed in the ISO global directory.

4.3. ELECTRONIC DOCUMENT DISTRIBUTION

WG 14 has conducted some of its detailed technical discussion using an e-mail reflector provided by the Danish UNIX Users Group, Copenhagen University College of Engineering and Keld Simonsen.

WG 14 also has an ftp and Web site provided by courtesy of the Copenhagen University College of Engineering, Danish UNIX Users Group and Keld Simonsen. WG 14 has also placed its documents on the ISO mandated site, and updates the site with each new document.

WG 14 is providing all the appropriate committee documents on the Committee Web site, eliminating the need for paper mailings.

WG 14 also now provides Web conference capabilities allowing technical experts that are not able to travel to participate.

WG 14 has previously reported the following issues with the e-committee system. The Working Group keeps the system up to date with all documents and is committed to switching to it once these issues are resolved.

- The URLs of documents in e-committee are neither static nor predictable. The defect report log, agendas, and document log all need to point to easily predictable and understandable URLs to keep errors to a minimum. They also need to point to unchanging URLs to prevent bit rot in the committee's records.
- The e-committee documents are not searchable by search engines. The C community has benefited greatly from WG 14 documents being available as search results.
- The document names and descriptions are truncated. On the external WG 14 site, this problem is avoided by having a document log with the description of each document and the name of its submitter. The file names are the N numbers of the documents, making the URLs predictable and simple.
- Corrupted files are difficult to replace, requiring intervention from ISO.

4.4. RECENT MEETINGS

23-26	Apr 2007	London, UK	BSI
08-11	Oct 2007	Kona, HI, USA	ANSI, Plum Hall
14-18	Apr 2008	Delft, Netherlands	NIN, ACE
08-12	Sept 2008	Santa Clara, CA, USA	ANSI, Cisco Systems
30-04	Mar/Apr 2009	Toronto, Canada	SCC, IBM
26-30	Oct 2009	Santa Cruz, CA, USA	ANSI, Plantronics
19-23	Apr 2010	Florence, Italy	Università Firenze
01-05	Nov 2010	Batavia, IL, USA	ANSI, Fermi Lab.
14-18	Mar 2011	London, UK	BSI
24-28	Oct 2011	Washington, DC, USA	ANSI, Blue Pilot
13-17	Feb 2012	Kona, HI, USA	ANSI, Bloomberg LP

11-13	Jun 2012	Web Conference	ISO, Blue Pilot
22-26	Oct 2012	Portland, OR, USA	ANSI, Intel
23-26	Apr 2013	Delft, NL	NIN, ACE
30-03	Sep/Oct 2013	Chicago, IL, USA	ANSI, DRW Trading Group
07-11	April 2014	Parma, IT	UNINFO, Univ. of Parma
27-30	Oct 2014	St. Louis, MO, USA	ANSI, Seymour
13-17	April 2015	Lysaker, NO	SN, Cisco
26-30	Oct 2015	Kona, HI, USA	ANSI, Plum Hall
11-14	Apr 2016	London, UK	BSI
17-21	Oct 2016	Pittsburgh, PA, USA	ANSI, CERT
03-06	Apr 2017	Markham, ON, Canada	SCC, IBM

4.5. FUTURE MEETINGS

30 Oct-03 Nov 2017	Albuquerque, NM, USA	ANSI, Keaton Consulting
23-26 Apr 2018	Brno, CZ	Red Hat