



**InterNational Committee for Information Technology Standards (INCITS)**  
Secretariat: Information Technology Industry Council (ITI)  
1101 K Street NW, Suite 610, Washington, DC 20005

[www.INCITS.org](http://www.INCITS.org)



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**WG14 N2142**

**INCITS PL22.11-2017-00001**

**Date: 2017-04-06**

**Reply To The Attention Of: Barry Hedquist**

**PL22.11 Secretary**

**Email: [beh@peren.com](mailto:beh@peren.com)**

**MINUTES (Draft)**  
**Apr 3 - 6, 2017**  
**MEETING OF ISO/IEC JTC 1/SC 22/WG 14**  
**AND**  
**INCITS PL22.11**

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**Dates and Times**

3 April, 2017 09:00 – 12:00 Lunch 13:30 – 16:30

4 April, 2017 09:00 – 12:00 Lunch 13:30 – 16:00

5 April, 2017 09:00 – 12:00 Lunch 13:30 – 16:30

6 April, 2017 09:00 – 12:00 Lunch 13:30 – 16:30

**Meeting Location**

*IBM Canada Software Lab - Toronto*

*8200 Warden Avenue*

*Markham, ON, Canada, L6G 1C7*

## Meeting information

Venue information: [N2084](#)

## Local contact information

*Rajan Bhakta <rbhakta@us.ibm.com>*

## 1. Opening Activities

### 1.1 Opening Comments (Bhakta, Keaton)

Rajan Bhakta, IBM, welcomed us to beautiful and scenic Markham, Ontario.

### 1.2 Introduction of Participants/Roll Call

<u>Name</u>	<u>Organization</u>	<u>NB</u>	<u>Comments</u>
Jens Gustedt	INRIA	France	
David Keaton	Keaton Consulting	USA	WG14 Convener
Daniel Plakosh	CERT/SEI/CMU	USA	WG14 ISO eCommittee Secretary
Lars Bjonnes	Cisco	USA	
Blaine Garst	The Planet Earth Society	USA	
Rajan Bhakta	IBM	CA	
John Parks	Intel	USA	PL22.11 Chair
Clark Nelson	Intel	USA	
Douglas Walls	Oracle	USA	PL22.11 IR
Fred Tydeman	Tydeman Consulting	USA	PL22.11 Vice Chair
Barry Hedquist	Perennial	USA	PL22.11 Secretary
Tom Plum	Plum Hall	USA	dialed in
Martin Sebor	Red Hat	USA	
Larry Jones	Siemens PLM Software	USA	WG 14 Project Editor – dialed in
Aaron Ballman	GammaTech	USA	
Clive Pygott	LDRA	USA	dialed-in
Hubert Tong	IBM	CA	
D. Hugh Redelmeier	Mimosa	CA	
Michael Wong	Codeplay / ISOCPP	CA	
Tom Skogland	LLNL	USA	

Ian McIntosh	IBM	CA	
Chris Tandy	IBM	USA	
Keld Simonsen	RAP	Denmark	
Sean Fertile	IBM	CA	
Kelvin Li	IBM	CA	

### 1.3 Procedures for this Meeting (Keaton)

The Meeting Chair and WG14 Convener, David Keaton, announced that procedures would be as per normal. Everyone was encouraged to participate in the discussion and straw polls.

Straw polls are an informal WG14 mechanism used to determine if there is consensus to pursue a particular technical approach or possibly drop a matter for lack of consensus. Straw polls are not formal votes, and do not in any way represent any National Body position. National Body positions are established in accordance with the procedures established by each National Body.

INCITS PL22.11 members reviewed the INCITS Anti-Trust and Patent Policy Guidelines at:

<http://www.incits.org/standards-information/legal-info>

All 'N' document numbers in these minutes refer to JTC1 SC22/WG14 documents unless otherwise noted.

The primary emphasis of this meeting was to review the progress of our subgroups and work on Defect Reports.

David Keaton is the meeting Chair.

Barry Hedquist is the Recording Secretary.

### 1.4 Approval of Previous Minutes [[N 2100](#)]

The previous minutes have been amended for typos, etc.  
The previous minutes are approved by unanimous consent.

**The final approved Pittsburgh minutes are N2141**

**The draft Markham minutes are N2142**

### 1.5 Review of Action Items and Resolutions

ACTION: Blaine to reconcile N2019 and N2026 for DR 469  
OPEN

ACTION: Convener to add discussion of 'P' docs to agenda for Markham.  
Done – N2133

ACTION: Convener to get final published version of C11  
Done

ACTION: Convener to add N2043 to SD 3  
Done – N2132

ACTION: Convener to add N2017 to SD 3  
Done

ACTION: Convener to add N2074 to SD 3  
Done

ACTION: Convener to add N2089 to SD 3  
Done

ACTION: Convener to add N2090 to SD 3  
Done

ACTION: Convener to add N2091 to SD 3.  
Done

ACTION: Convener to add N2049 to SD 3.  
Done

ACTION: Convener to Add N2050 to SD 3.  
Done

ACTION: Convener to add nodiscard attribute to SD3 (N2051, or follow-on papers.)  
Done

ACTION: Convener to add fallthrough attribute to SD3 (N2052, or follow-on papers.)  
Done

ACTION: Convener to add maybe\_unused attribute to SD3 (N2053, or follow-on papers.)  
Done

ACTION: Clark to forward paper for C++ on '`__has_include__`' to the reflector.

Done. N2101

ACTION: Clark to review, and write up input for DR 485

Done. SC22WG14.14484 & 14486

ACTION: Blaine to correct editing error on DR 487

Done

ACTION: DR 493 Blaine to correct statement regarding mtx\_t issues. They are NOT implementation defined, but 'not specified'.

Done

ACTION: Clark will add words to DR 494.

Done. SC22WG14.14483

ACTION: Blaine to write up additional words for DR 496.

Done. Some words added.

ACTION: Clark will draft 'something' on DR 499 and post it to the reflector.

Done 14628

ACTION: Rajan to provide an example for DR 501

Closed. Defect Log

ACTION: Rajan will write up a Committee Discussion on DR 497

Closed. Defect Log

ACTION: Robert Secord to write up a schedule for future action with TS 17961.

Closed N2139

ACTION: Blaine to write up a compendium report for DRs.

Closed N2109, et al.

## **1.6 Approval of Agenda (N2133)**

### **N2133, Keaton, Preliminary Agenda for WG14 / PL22.11 Meeting April 3-6, 2017**

Revisions to the Revised Agenda are posted and reflected here.

Added Items:

6.20 N2138 with N2131

8.3 N2137

### 8.1.2 N2139

Deleted Items: None

Agenda approved by unanimous consent.

## **1.7 Identify National Bodies Sending Experts**

USA, Canada, Denmark

## **2. Reports on Liaison Activities**

### **2.1 SC 22**

Issues with ITTF making edits to submitted Standards and TS's. In process.

Term limits affect SC22 Chair Rex. David Keaton has volunteered to take over SC 22.

### **2.2 PL22.11/WG 14**

2.2.1 TS 21938-1 (CPLX) NWIP and PDTS were approved.

2.2.2 WG 14 Standing Document (N2132 - SD 3)

### **2.3 PL22.16/WG 21**

WG 21 is about to start a DIS Ballot on the C++ Standard, ISO/IEC 14882. Numerous TS ballots and development efforts are also underway, and in various stages.

### **2.4 PL22.**

No report.

### **2.5 WG 23**

Work continues on its TR. What happens to the C Report presented in London is TBD.

### **2.6 MISRA C**

#### **2.6.1 MISRA C Liaison Report (N2143) Banks**

Andrew Banks, Chairman, MISRA C Working Group, presented the WG14 Liaison Report. This report points out a number of differences between MISRA C, 2012, and ISO/IEC 17961:2013, C Secure. The MISRA C Working Group plans on supporting the activity to update ISO/IEC 17961.

There are also two proposals submitted for consideration for the next revision to the C Standard: N2008, Enumerations and N2112, Proposal to Enumerate and Cross-Reference Annex J.

## **2.7 Other Liaison Activities**

None

## **3. Reports from Study Groups**

### **3.1 C Floating Point activity report**

Monthly telecons continue. IEEE 754 working on a new revision. WG14 Floating Point TS's are published.

### **3.2 CPLEX activity report**

No report.

### **3.3 C Safety and Security Rules Study Group**

Teleconferences ongoing, discussion of MISRA rules. N2139

## **4. Teleconference Meeting Reports**

### **4.1 Report on any teleconference meetings held**

## **5. Future Meetings & Mailings**

### **5.1 Future Meeting Schedule**

- Fall 2017 – Albuquerque, NM 30 Oct - 3 Nov (tentative)  
WG 21 will meet in Albuquerque Nov 6-11, 2017  
ACTION Convener to have venue information in post meeting mailing
- Spring 2018 - Brno, CZ. April 23 – 26, 2018 (tentative).  
Possible time frames available this week.

- Fall 2018 - TBD.
- Spring 2019 – Denmark (tentative) ??

## 5.2 Future Mailings

- Post Markham: 01-May-2017
- Pre Albuquerque: 02-Oct-2017

## 6. Document Review

### 6.1 Transitional version of C11 processed from LaTeX [N 2130]

N2130 is a LaTeX version of C11. We want to check the LaTeX version with the existing PDF. N1570 is a final draft, so expect differences. Best to use a 'real' copy. David has a version with Sally's name on it, so do not misuse that document if you ask for it. Two people review the same chunk. Pages based on N2130. Send results to:

Larry Jones: [lawrence.jones@siemens.com](mailto:lawrence.jones@siemens.com)

Jens Gustedt: [jens.gustedt@inria.fr](mailto:jens.gustedt@inria.fr)

Assignment:

Fred & Barry: 1-50 (pdf page 50). to 6.2.5, p 50.

John & Clark : 51-100, 6.6

Martin & Tom Scogland: 101-150, Clause 6 end.

Hubert & Michael: 151 – 200, Clause 7 – 7.12.6.2

Blaine & Lars: 201 – 250, thru 7.21.6.1

Hugh & Rajan: 251 – 300 thru 7.26.5.5

Aaron & David: thru Clause 7.

Tom Plum & Clive: Annex A – F.

David & Fred: Annex G – K.

Larry & Aaron: Annex L – end (index)

Check that defined terms are also in the Index.

Check Section and Clause numbers.

Clive pointed out that a tool, Beyond Compare, may be useful. Clive put an example on the screen. Looks good, but some do not care for this tool.

Other tools: wdiff (in cygwin), real Acrobat

ACTION: Jens to publish an improved LaTeX version NLT the post meeting mailing.

Teleconference – editorial group meeting (all of us). Jun 7, 11 am EDT.



Send input to Jens and Larry at least 1 week prior, May 31.

## 6.2 C2X Proposal: Maximum normalized FP numbers [\[N 2092\]](#)

Add to SD 3 ?

Some believe that motivating examples are needed to motivate us to add this to C2X.

ACTION: Rajan volunteered to provide an example of why this would matter (N2029). Use and non-use.

SC22WG14.14643:

Here is a possible use/need for the `LDBL_NORM_MAX` macro while also using `LDBL_MAX`.

```
#include <math.h>
#include <stdio.h>

int main(void) {
    long double values[] = { ... }; // A bunch of finite long double values
    long double results[sizeof(values)];

    for (int i = 0; i < sizeof(value); i++) {
        results[i] = 1.0 / my_floating_point_calculation(values[i]); // Could be anything like
        arc sin, etc.

        if ((results[i] > LDBL_NORM_MAX) && (results[i] <= LDBL_MAX)) {
            printf("We may have lost some precision!\n");
            return 1;
        } else if (results[i] > LDBL_MAX) {
            printf("We have an overflow!\n") // May be an infinity if supported
            return 1;
        }
    }
    ...

    return 0;
}
```

Blaine believes the above example is a good motivating example.

ACTION: Fred to look at all DRs involving normalized (`_NORM_`) for consistency.

## 6.3 Number of Fractional Digits in `fprintf %a` Output [\[N 2098\]](#)

This is not really a DR, but could be considered a change to the Standard. It proposes to add a specification for that which is not specified.

ACTION: Convener to add N2098 to SD3.

The committee prefers an option similar to #3, or that goes beyond the first two.

Straw Polls

Who can live with:

Option 1: 0

Option 2: 9

Option 3: 15

There is at least one strong objection to #2.

Also, look at the use of the word 'sufficient' in N2098.

#### **6.4 \_\_has\_include for C [\[N 2101\]](#)**

Add to SD 3 ? Yes – C2X.

Action: Convener to add N2101 to SD 3.

#### **6.5 Compatibility of enums, structures, and unions in the same translation unit [\[N 2105\]](#) Add to SD 3 ?**

Is there a benefit to adding this paper to the SD 3?

There is no consensus to adopt this change, or understood a benefit for doing so.

#### **6.6 Enumerating and Cross-referencing Annex J [\[N 2112\]](#)**

Larry's thoughts are highly mixed. He does not think this is a good solution. He sees this as editorial, and would like to think about it.

#### **6.7 C2X Proposal: Preprocessor line numbers [\[N 2115\]](#)**

Add to SD 3 ? No.

What do we want to do? Also discuss N2129 from Jens, Deprecate \_\_LINE\_\_

Straw Polls:

Leave it alone ? 9 - ? - ? PASSES

Implementation Defined? - 0

Well Defined ? - 1

Recommended practice ? - 4

N2129: Deprecate \_\_LINE\_\_

Polls

Deprecate \_\_LINE\_\_ 2-13-1 (y-n-a) FAILS

Have a new version of \_\_LINENO\_\_

Straw Poll: 5-8-3 NO

New version of \_\_LINE\_\_ that is a string

Straw Poll: 5-6-6 NO

The first option, leave \_\_LINE\_\_ alone, prevails.

### **6.8 C2X Proposal: Properties of Complex [\[N 2116\]](#)**

Polls: (y-n-a)

Add to SD 3 as is? 2-5-10 - NO

Write up an approach with a new Pragma ? 1-7-8 - NO

### **6.9 C2x proposal - TS 18661-3 - interchange and extended types [\[N 2117\]](#)**

**Add to SD 3 ?**

Rajan presented. Do we want to add Part 3 to the SD 3? We do not seem to be committed, yet.

We have committed to add Parts 1 & 2 to C2X. Parts 3, 4, 5 assume Parts 1 & 2 are applied.

ACTION: Convener to add TS 18661, Part 3 to the SD 3.

### **6.10 C2x proposal - TS 18661-4a - mathematical functions [\[N 2118\]](#)**

**Add to SD 3?**

Rajan presented.

ACTION: Convener to add TS 18661, Part 4, mathematical functions, to the SD 3.

### **6.11 C2x proposal - TS 18661-4b - reduction functions [\[N 2119\]](#)**

**Add to SD 3?**

Rajan presented.

There does not seem to be a direct conflict with CPLEX.

ACTION: Convener to add TS 18661, Part 4, reduction functions, to the SD 3.

### **6.12 C2x proposal - TS 18661-5a - evaluation format pragmas [\[N 2120\]](#)**

**Add to SD 3?**

Rajan presented.

ACTION: Convener to add TS 18661, Part 5, evaluation format pragmas, to the SD 3.

### **6.13 C2x proposal - TS 18661-5b - optimization control pragmas [\[N 2121\]](#)**

**Add to SD 3?**

Rajan presented.

ACTION: Convener to add TS 18661, Part 5, optimization control pragmas, to the SD 3.

### **6.14 C2x proposal - TS 18661-5c - reproducible results [\[N 2122\]](#)**

**Add to SD 3?**

Rajan presented.

ACTION: Convener to add TS 18661, Part 5, reproducible results, to the SD 3.

**6.15 C2x proposal - TS 18661-5d - alternate exception handling [[N 2123](#)]**

**Add to SD 3? Straw Poll: 6 – 8 – 4 - NO**

**Straw Poll: Do we want something along the lines of: 12 – 2 – 4. YES**

Rajan presented.

ACTION: Convener to add something along the lines of TS 18661, Part 5, alternate exception handling, to the SD 3.

**6.16 C2x proposal - rounding direction macro FE\_TONEARESTFROMZERO [[N 2124](#)]**

**Add to SD 3?**

Rajan presented.

ACTION: Convener to add TS 18661, Part 5, rounding direction macro, to the SD 3.

**6.17 C2x proposal - Proposed FP DRs for TS 18661 - set #3 [[N 2125](#)]**

DDR 1 – Now DR 12 - OPEN

DDR 2 – Now DR 13 - OPEN

DDR 3 – Now DR 14 – OPEN

**6.18 C2X Proposal: Default rounding mode [[N 2128](#)]**

**Add to SD 3? Straw Poll: 4 – 7 – 7 No.**

**6.19 Deprecate \_\_LINE\_\_ [[N 2129](#)]**

**Add to SD 3 ?**

Discussed this paper with 6.7 N2115. See 6.7.

**6.20 Concerns with CPLEX Working Draft (N 2017) [[N 2131](#)] [[N2138](#)]**

Concerns from OpenMP community about CPLEX and adoption into the C Standard.

N2131 addresses concerns with CPLEX. Tom Skogland, LLNL, presented. There are several concerns:

- Synchronization Requirements
- Concurrency and Interoperability
- Viral Annotations
- Loop Hints

N2138 contains responses from Clark Nelson to N2131. The presentation was essentially a dialog between Clark and Tom on issues with CPLEX and what Tom was looking for as a user. Clark would like to see some code examples that reflect some of these items, and Tom agreed to put some together.

**Thurs:**

Tom presented code examples that cause them problems.

What do we want to do with the examples presented. WG14 owns the document. We could give the document back to the Study Group, but Clark is not clear where the Study Group is. Clark can ask the Study Group to fix the problems, and see what happens. Getting OpenMP people to participate could be problematic.

ACTION: Clark to take code examples back to CPLEX, and come back with recommendations on how to proceed.

## **7.0 DEFECT REPORTS**

### **7.1 Discussion on the Defect Report Process**

per normal

### **7.2 IS 9899:2011 Defect Reports [\[N 2109\]](#)**

In addition to normal DR processing, the following items have new material to consider.

#### **7.2.1 Replacement Suggested Technical Corrigendum for DR 501 [\[N 2108\]](#)**

In 7.31, add a subclause:

7.31.x Mathematics Use of the DECIMAL\_DIG macro is an obsolescent feature. A similar type-specific macro, such as LDBL\_DECIMAL\_DIG can be used instead.

In 5.2.4.2.2, in the bullet defining DECIMAL\_DIG, attach a footnote to the wording:

DECIMAL\_DIG

where the footnote is:

\*) See “future library directions” (7.31.x).

#### **7.2.2 DRs in REVIEW status that are ready to CLOSE (Vers 1.11)**

DR 444 - Moved to CLOSE

DR 460 - Moved to CLOSE

DR 467 – Revert to OPEN

Some discussion on whether or not this DR is really needed. Examples?

The model needs to be enhanced.

ACTION – Fred to write PTC for DR 467

DONE - SC22WG14.14655:

Add to DR 467 Proposed Technical Corrigendum the following:

Add to the end of 5.2.4.2.2 #1 (after the 5 indented items and before paragraph 2):

For each floating-point type: b, emin, emax, p are fixed constants.

In paragraph 3, change "normalized floating-point numbers" to italics.

And change:

normalized floating-point numbers ( $f1 > 0$  if  $x \neq 0$ ),

To:

normalized floating-point numbers ( $x \neq 0$ ,  $f1 > 0$ , all possible  $f[k]$  digits result in values representable in the type) footnote,

Footnote: Some implementations may have types with numeric values which are not covered by this model.

Leave OPEN

Also DR 432 - was CLOSED, revert to OPEN and examine with respect to DR 467.

DR 473 - Moved to CLOSE

ACTION: Editor to make the words English.

DR 480 ??? Minutes say REVIEW Status.

DR 481 - Moved to CLOSE

DR 482 - Moved to CLOSE

**DR 485 - OPEN ?**

This DR was erroneously listed as REVIEW. See DR 485 under OPEN DRs, 7.2.3.

DR 487 - Moved to CLOSE

Editorial - Change "Suggested" to "Proposed" TC.

DR 489 - Moved to CLOSE

DR 490 - Moved to CLOSE

DR 491 - Moved to CLOSE

DR 492 - Moved to CLOSE

### 7.2.3 Prior DRs in OPEN Status

These existing DRs are in OPEN status:

DR 476 - volatile semantics for lvalues [[N1956](#)]

This DR was last discussed in April 2016. We skipped it in Pittsburgh

C++ has found similar problems, and is correcting them.

Move Suggested TC to Proposed TC, clean up editorial items.

Drop the “suggestion” words.

Leave OPEN

DR 480 - `cond_wait` and `cond_timewait` should allow spurious wake-ups [[N1964](#)]

Moved to REVIEW

DR 485 – Reverted to OPEN from list above (7.2.2).

What does the macro do, if anything. Martin’s position is that it really does nothing. Remove the need for the macro. Make a PCR saying the changes needed are outside the scope of this DR.

Deprecate the use of the macro for C17? Also add it to “Deprecated Features” for C17. In the interim, the macro is not needed?

ACTION: RE: DR 485. Martin to write a paper to get rid of the macro, put it into “Future Directions” for C17, do it for C2X.

Martin’s words for DR 485: (SC22WG14.14645)

During today’s discussion of DR 485 I volunteered to write up proposed words to include in the upcoming 2017 C TC/update to reflect WG14’s position on the future direction in this area.

The suggested changes do two things. Change (1) acknowledges that the macro can only be used to initialize scalars, updates Future Library directions with the expected removal of the `ATOMIC_VAR_INIT` macro, and adds a footnote to 7.17.2.1 pointing to the Future Library Directions section. Going a step further, (2) is the minimum change necessary to make direct initialization of atomic objects work.

Change 1.

In 7.17.2.1 The `ATOMIC_VAR_INIT` macro, change paragraph 2 as follows:

The `ATOMIC_VAR_INIT` macro expands to a token sequence suitable for initializing an atomic object of a `scalar` type that is initialization-compatible with `value`. `new footnote`

`new footnote`) An atomic object of any type can be initialized the same way as an object of the corresponding non-atomic type. See future library directions.

Add a new paragraph to 7.31.8 Atomics `<stdatomic.h>`:

The macro `ATOMIC_VAR_INIT()` cannot be used to explicitly initialize objects of user-defined types. Since the macro is not necessary to initialize objects of any atomic types it will be removed in a future revision of the standard.

Change 2.

In 7.17.2.1 The `ATOMIC_VAR_INIT` macro, further modify paragraph 2 as follows:

An atomic object with automatic storage duration that is not explicitly initialized ~~using `ATOMIC_VAR_INIT`~~ is initially in an indeterminate state;

Hubert Tong's response (SC22WG14.14647)

I have a question. My cursory search in C11 and in the Defect Reports document (N2109) did not reveal normative text which indicates how "indeterminate state" differs meaningfully from "indeterminate value". My wild guess on the "indeterminate state" as opposed to a "valid state" is that atomic objects have a state beyond the "value". An indeterminate value may be erased by assignment, but assignment to an atomic object with indeterminate state is meant to be undefined behavior.

I am wondering if there is text which covers this that I missed. It would help inform me on how the sentence in "Change 2" is to be read (both now and after the change).

Doug Gwyn response (SC22WG14.14648)

Assignment (writing) to an object that is initially indeterminate in some way is supposed to determine its state/value, and must not be classified as causing undefined behavior. (Reading the content of an indeterminate object can and probably should cause undefined behavior.) Without a macro to initialize a non-auto atomic object, presumably it is default-initialized to `0/null_ptr` and the implementation needs to figure out how to set up any corresponding state.

Hubert Tong response (SC22WG14.14650)

If writing to an atomic object with an indeterminate state does not cause undefined behavior (and indeed causes the state to be "valid"), then I would like to understand why the wording uses "state" instead of "value". I am not convinced that the difference was unintentional. For an



in-object lock implementation, the natural interpretation of the indeterminate state is that the lock is uninitialized in such a way that the implementation is not expected to recover.

I would prefer not to use the same vague words ("indeterminate state") in such a way that the intended interpretation changes between versions of the Standard by means of "reverse engineering from the apparent intent of the committee". Which is to say that, if we leave "indeterminate state" in the text, then we ought to define how an object with such a state behaves in relation to the rest of the language.

What do we want to do with DR 485? C17 ? C2X ?

Straw Poll: Do we want any change along these lines for C17: 11-2-5. Yes

Do we want Change 2 from SC22WG14.14645 for C17: 10-1-5 – Yes  
Change 2 from SC22WG14.14645 goes into C17.

DR 488 - `c16rtomb()` on wide characters encoded as multiple `char16_t`  
Move the changes in the Committee Discussion to a PTC.  
Leave OPEN

DR 493 - Mutex initialization underspecified [ [N2025](#) ]  
PCR Exists.  
Moved to REVIEW.

DR 494 - Part 1: Alignment specifier expression evaluation  
Move the wording changes in the Committee Discussion to PTC.  
Leave OPEN

DR 495 - Part 2: Atomic specifier expression evaluation [ [N2027](#) ]  
No one is signed up to do the work needed.  
Leave OPEN

DR 496 - `offsetof` questions [ [N2031](#) ]  
Joseph wrote a paper on this for C99, but never submitted it. However, we do not have a Suggested TC, so there is not much we can do. The term 'subobject' is used in the C Standard, but is not defined.  
ACTION: Clark to write a draft of a Proposed Technical Corrigenda DR 496.  
Leave OPEN

DR 497 - "white-space character" defined in two places [ [N2032](#) ]  
*Suggested TC exists with four options. Preferred 2 and 4, rejected 1 and 3.*  
What does Larry want to do? Blaine prefers 4. Clark: Who is confused by this? There does not seem to be a real problem here, i.e. everyone understands what is intended.  
ACTION: Fred to write a STC for DR 497.  
Fred has submitted SC22WG14.14657. There were some editorial level changes to that paper.

Take portions of SC22WG14.14657 and fold into a PTC. Some are out of scope.  
Leave OPEN.

DR 498 - mblen, mbtowc, and wctomb thread-safety

*Suggested TC exists under CD.*

Adopt Committee Discussion as Proposed TC ? Change section to subclause.

Leave OPEN

DR 499 - Anonymous structure in union behavior [\[N2038\]](#)

Clark has provided some new words. SC22WG14.14628.

Leave OPEN

DR 500 - Ambiguous specification for **FLT\_EVAL\_METHOD**. [\[N2077\]](#)

Proposed TC exists.

Moved to REVIEW

DR 501 - Can **DECIMAL\_DIG** be larger than necessary? [\[N2077\]](#) [\[2108\]](#)

Proposed CR and Proposed TC exist, but See 7.2.1 for a replacement Suggested TC.

DECIMAL\_DIG does not work.

Straw Poll: Obsolete DECIMAL\_DIG 6-0-7.

Adopt Suggested TC as Proposed TC

Move to OPEN

DR 502 - Flexible array member in an anonymous struct [\[N2080\]](#)

*The committee agrees that defining a flexible array as the sole member of an anonymous struct is permitted as long as the flexible array is not the sole member of the enclosing object.*

*This issue might also be resolved via [DR 499](#)*

Rajan points out that DR 502 differs enough from DR 499 they should be treated separately.

Clark disagrees with the Committee Discussion from Oct 2016. There is an invalid struct within the struct.

ACTION: Blaine to draft a PCR for DR 502

Leave OPEN

DR 503 - Hexadecimal floating-point and strtod [\[N2082\]](#)

*Proposed CR exists.*

Moved to REVIEW.

#### **7.2.4 New DRs - OPEN Status**

NONE

#### **7.2.5 DRs with FUTURE Status**

The following DRs have a status of FUTURE. Should they be added to SD 3? Should there be a Proposed Committee Response ?

DR 469 - lock ownership vs. thread termination

DR 479 - unclear specification of `mtx_trylock` on non-recursive muteness

DR 485 - Inconsistent specification for arithmetic on atomic objects  
We have done DR 485. See OPEN DRs, 7.2.2.

### **7.3 TS 17961:2013+Cor 1:2016 Defect Reports [\[N 2110\]](#)**

#### **7.3.1 TS 17961 DRs in REVIEW Status ready to CLOSE**

DR 2 - Moved to CLOSE

#### **7.3.2 Prior TS 17961 DRs in OPEN Status**

None

#### **7.3.3 New TS 17961 DRs in OPEN Status**

DR 2 Moved to CLOSE

### **7.4 TS 18661 Defect Reports [\[N 2111\]](#)**

In addition to normal DR processing, the following items have new material to consider.

#### **7.4.1 Simpler TC for TS 18661 DR9 [\[N 2127\]](#)**

See 7.4.4, DR 9

#### **7.4.2 Example of the effect of the change for CFP DR11 [\[N 2126\]](#)**

See 7.4.4, DR 11

#### **7.4.3 TS 18661 DRs in REVIEW Status ready to CLOSE**

DR 1 - Moved to CLOSE

DR 2 - Moved to CLOSE

DR 3 - Moved to CLOSE

DR 4 - Moved to CLOSE

#### 7.4.4 Prior TS 18661 DRs in OPEN Status

DR 5 - Part 1: Is return of same type convertFormat or copy? [[N2077](#)]

*Proposed TC exists.*

DR 5 Moved to REVIEW

DR 6 - Part 1: **fetetestexceptflag** and exceptions passed to **fegetexceptflag** [[N2077](#)]

*Proposed TC exists.*

DR 6 Moved to REVIEW

DR 7 - Part 1: Editorial changes [[N2077](#)]

*Proposed TC exists.*

DR 7 Moved to REVIEW

DR 8 - Part 2: Editorial clarification about number digits in the coefficient [[N2077](#)]

*Proposed TC exists.*

DR 8 Moved to REVIEW

DR 9 - Part 3: Missing specification for usual arithmetic conversions, tgmth [[N2077](#)]

*Proposed TC exists.*

*See 7.4.1 for Simpler TC.* [[N 2127](#)]

N 2127 is a Suggested TC that is simpler to understand. The first part of the Suggested TC remains. Adopt N2127 as Suggested TC.

Leave OPEN

DR 10 - Part 1: wrong type for **fesetmode** parameter [[N2077](#)]

*Proposed TC exists.*

DR 10 – Moved to REVIEW

DR 11 - Part 2: a-style formatting not IEC 60559 conformant [[N2077](#)]

*Proposed TC exists. See 7.4.2, Example of the effect of the change for CFP DR11* [[N 2126](#)]

DR 11 – Why is %a different from binary FP? Leave OPEN.

ACTION – Rajan to write up Committee Discussion for DR 11. TS 18661.

#### 7.4.5 - New TS 18661 DRs in OPEN Status.

NONE

## 8. Other Business

### 8.1 Review of strategy for document development and maintenance

#### 8.1.1 ISO/IEC 9899:2011 - The C Standard

Once the LaTeX conversion is verified, all DRs in CLOSED Status get rolled in. All DRs not CLOSED continue until CLOSED. Create new Working Drafts after each meeting post C 17. Move the DR Compendium to LaTeX as well? TBD. We are cool to that idea.

ACTION: Larry & Jens to examine the use of a server to maintain the Standard.

When to Stop accepting DRs? Lots of discussion. No resolution.

#### 8.1.2 TS 19961:2013 + Cor 1: 2016 - C Secure Coding Rules [N2139]

Slide presentation on C Secure Coding Rules, with a schedule for development of a DIS in Dec 2022. Expands TS 17961 to include safety and concurrency.

#### 8.1.3 TS 18661, Parts 1-5 - Floating Point

All of these parts have been added to SD 3 for consideration for inclusion into C2X. Newer version of the IEEE spec is in process now, and will be addressed. What do we, WG14, want the FP Group to address? (Rajan will send task list to me for posing here).

Task Listing:

Tasks that the group can take on/continue:

1. Write and address DRs against the TS as needed, and submit them to WG 14.
2. Propose to WG 14 incorporating the TS (or parts of it) into C2x.
3. Support accepted proposals through the C2x standardization process.
4. Write proposals for a C binding for the new features in IEEE 754-2018, and followup with WG 14. This is a compatible change to 754, with only a very few new (recommended) features, which if addressed by our current efforts would give us another 10 or so years for FP standard support.
5. Revise parts of the TS that are not incorporated into C2x to be based on C2x.

Keep the group going.

Do everything listed.

#### 8.1.4 TS 21938-1 and future parts - Parallelism

### 8.2 Discuss adopting something along the lines of WG21's system of P-numbered documents with revision numbers.

Use 'C' instead of 'P'.

ACTION: Convener to coordinate with WG21 on the mechanics of using P or C documents for proposals.

### **8.3 N2137, Attributes**

Aaron Ballman presented. N2137 is a work in process, and looking for WG14 input.

Attributes do not work with K&R style function definitions. That's OK.

Plan is to have a paper for Albuquerque. Some concern voiced over the lexical aspects of attributes.

### **8.4 Danish Comments on CPLEX**

We reviewed and responded to Comments from Denmark for the NWIP and PDTS for CPLEX.

## **9.0 Resolutions and Decisions Reached**

### **9.1 Review of decisions reached**

Decide to add new material to C17 in addition to Technical Corrigenda from DRs.

### **9.2 Review of Action Items**

ACTION: Blaine to reconcile N2019 and N2026 for DR 469

ACTION: Convener to have venue information for Albuquerque in post meeting mailing.

ACTION: Convener to add N2098, along the lines of Option 3, to SD 3.

ACTION: Convener to add N2101 to SD 3.

ACTION: Convener to add TS 18661, Part 3 to the SD 3.

ACTION: Convener to add TS 18661, Part 4 to the SD 3.

ACTION: Convener to add TS 18661, Part 5, evaluation format pragmas, to the SD 3.

ACTION: Convener to add TS 18661, Part 5, optimization control pragmas, to the SD 3.

ACTION: Convener to add TS 18661, Part 5, reproducible results, to the SD 3.

ACTION: Convener to add something along the lines of TS 18661, Part 5, alternate exception handling, to the SD 3.

ACTION: Convener to add TS 18661, Part 5, rounding direction macro, to the SD 3.

ACTION: DR 467. Fred to write up a model and definition for normalized DOUBLE DOUBLE.

ACTION: DR 473. Moved to CLOSE. Editor to make words English.

ACTION: DR 496. Clark to write a draft of a Proposed Technical Corrigenda.

ACTION: DR 497. Fred to write a Suggested TC.

DONE - SC22WG14.14657

ACTION: TS 18661, DR 11. Rajan to write up a Committee Discussion.

DONE - Blaine

ACTION: Convener to coordinate with WG21 on the mechanics adding a 'C' or 'P' designated papers for proposals to WG14.

ACTION: Blaine to draft a PCR for DR 502

ACTION: Larry & Jens to examine the use of a server to maintain the Standard.

ACTION: Clark to take code examples as an N document back to CPLEX, and come back with recommendations on how to proceed.

ACTION: Jens to publish an improved LaTeX version NLT the post meeting mailing.

## **10. Thanks to Host**

Special Thanks to IBM for the meeting facilities and great weather.

## **11. Adjournment**

Meeting adjourned April 6, 3:27 PM

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## Minutes (Draft) for the PL22.11/US TAG Meeting

Tuesday April 4, 2017 at 16:00

<u>Name</u>	<u>Organization</u>	<u>Principal/Alternate</u>	<u>Comments</u>
David Keaton	Keaton Consulting	Principal	
Daniel Plakosh	CERT/SEI/CMU	Principal	
Jens Gustedt	INRIA - France		
Lars Bjonnes	Cisco	Principal	
Blaine Garst	The Planet Earth Society		
Rajan Bhakta	IBM	Principal	
John Parks	Intel	Principal	PL22.11 Chair
Clark Nelson	Intel	Alternate	
Clive Pygott	LDRA	Principal	
Douglas Walls	Oracle	Principal	PL22.11 IR
Barry Hedquist	Perennial	Principal	PL22.11 Secretary
Tom Plum	Plum Hall, Inc.	Principal	
Martin Sebor	Red Hat	Principal	
Aaron Ballman	GrammaTech		First meeting
Fred Tydeman	Tydeman Consulting	Principal	Vice Chair

### 1. Approval of Agenda

Items added:

8.1 Systematic Review, ISO/IEC TS 17961:2013, C Secure Coding Rules

8.2 IR Position

Items deleted: none

The Agenda was approved by unanimous consent (Tydeman/Sebor)

### 2. Approval of Previous Minutes (PL22.11-2016-00007)



The prior meeting minutes for Pittsburgh, were amended for typos, et al, and approved by unanimous consent. (Keaton/Tydeman)

**3. INCITS [Antitrust Guidelines and Patent Policy](#)**

Reviewed the Antitrust Guidelines and Patent Policy

**4. INCITS official designated member/alternate information**

Be sure to let Lynn Barra know of any changes.

**5. Identification of PL22.11 Voting Members: 11**

**1. PL22.11 Members Attaining Voting Rights at this Meeting**

Keaton Consulting

**2. Prospective PL22.11 Members Attending their First Meeting**

Blaine Garst - The Planet Earth Society

Aaron Ballman - GrammaTech

**6. Members in Jeopardy**

**1. Members in jeopardy due to failure to return Letter Ballots**

none

**2. Members in jeopardy due to failure to attend Meetings**

**1. Members in jeopardy for failure to attend this meeting.**

none

**2. Members who regained voting rights by attending this meeting**

none

**3. Members who lost voting rights for failure to attend this meeting**

none

**3. Members who previously lost voting rights who are attending this meeting**

none

**7. Procedures for Forming a US Position**

per normal

**8. New Business**

**1. Systematic Review, ISO/IEC TS 17961:2013, C Secure Coding Rules)**

Question: Do you approve of the answers provided for the Systematic Review of ISO/IEC TS 17961:2013, C Secure Coding Rules.

Ballot: Roll Call

CERT/SEI/CMU - YES

Cisco - YES

IBM - YES

Intel – YES

Keaton Consulting - YES

LDRA Technology - YES

Oracle - YES

Perennial - YES

Plum Hall - YES

Red Hat - YES

Tydeman Consulting – YES

11 - 0 – 0 Passes

**2. IR position**

Douglas has been working on the Committee and serving as IR for 20 years. He will get an INCITS Merit Award. John Parks read the citation.

Dear Mr. Walls,

It is with great pleasure that the InterNational Committee for Information Technology Standards (INCITS) will honor you with the INCITS Merit Award. This is an award normally presented to no more than four participants who have demonstrated continuous support for the work of INCITS. INCITS would like to recognize your numerous contributions to the INCITS/PL22.11 – *Programming Language C* standards community. You have served as a major contributor to the committee for more than 20 years in several

roles, such as International Representative, US Head of Delegation to the ISO/IEC JTC 1/SC 22/Working Group 14 and technical contributor. You've been a key contributor to numerous revisions of the C programming language standard, as well as technical reports and technical specifications. Your leadership, tireless dedication, and commitment to quality have earned you the gratitude of your fellow members of INCITS/PL22, INCITS/PL22.11 and ISO/IEC JTC 1/SC 22/WG14.

You have demonstrated continuous and outstandingly effective support for the development of standards and your comprehensive knowledge of the subject matter is unparalleled. You are recognized as dedicated and astute and your willingness to accept responsibilities is vital to the successful development of national and international standards.

Please join us on Tuesday, April 4, 2017 in Palm Springs, CA so we may present this award you at the awards dinner.

Sincerely,  
Lynn Barra  
Director, INCITS Standards Operations  
INCITS/Information Technology Industry Council

## **9. Next Meeting**

The next meeting of PL22.11 will be in Albuquerque, NM, Tuesday, October 31, 2017.

## **10. Adjournment**

Meeting adjourned by unanimous consent (Tydeman/Nelson) at 16:30 hours, April 4, 2017.