

Document number: N3769
Date: 2013-10-16
Reply to: Kyle Kloepper (Kyle.Kloepper@riverbed.com)

Minutes (September 2013)

PL22.16 Meeting No. 61
23-28 September 2013 – Chicago, Illinois, USA

1 Opening activities

Clamage calls the meeting to order on Monday 23 September 2013 at 9:03 a.m. CST (14:03 UTC).

1.1 Opening comments, welcome from host

Liber welcomes everyone to Chicago and thanks DRW Trading Group for hosting.

1.2 Introductions

Clamage asks everyone in the room to introduce themselves.

1.3 Meeting guidelines (Patent and Anti-Trust)

Clamage directs group to the following websites without further comment:

- http://www.incits.org/pat_slides.pdf
- <http://www.incits.org/inatrust.htm>

1.4 Membership, voting rights, and procedures for the meeting

Clamage discusses differences between PL22.16 and WG21. Clamage explains WG21 voting. Nelson explains PL22.16 voting.

1.5 Agenda review and approval

Motion: to accept agenda in N3704.
Moved by: Marshall Clow
Seconded by: Nevin Liber

Unanimous consent.

1.6 Approval of the minutes of the previous meeting

Motion: to accept minutes from previous meeting (N3622).
Moved by: Barry Hedquist
Seconded by: Pablo Halpern

Unanimous consent.

1.7 Editor's report, approval of draft

Du Toit presents the editors report (N3692). He states that he applied changes to the working draft as directed by the committee. Any deviations to proposed wording is noted in the report.

Motion: to accept N3691 as the working draft.
Moved by: Pablo Halpern
Seconded by: Nevin Liber

Unanimous consent.

Motion: to accept N3693 as the working draft TS Filesystem.
Moved by: Beman Dawes
Seconded by: Alisdair Meredith

Unanimous consent.

1.8 Liaison reports (including WG21 study groups)

SC22 report:

Sutter reports on SC22.

SC22/WG14 (C) report:

Plum and Nelson report on WG21.

Other:

Clamage asks if there is a database liaison. Seymour says there is no liaison yet.

1.9 WG and SG progress reports and work plans for the week

Core working group (CWG):

Miller reports for CWG.

Library working group (LWG):

Meredith reports for LWG.

Evolution working group (EWG):

Stroustrup reports for EWG.

Library Evolution working group (LEWG):

Yasskin reports on LEWG.

Study group 1 – Concurrency (SG1):

Boehm reports goal is to have direction for each NB comment.

Study group 2 – Modules (SG2):

Gregor reports there are no new papers.

Study group 3 – File System (SG3):

Dawes reports for SG3.

Study group 4 – Networking (SG4):

Kloepper reports for SG4.

Study group 5 – Transactional Memory (SG5):

Wong reports for SG5.

Study group 6 – Numerics (SG6):

Crowl reports for SG6.

Study group 7 – Reflection (SG7):

Carruth reports for SG7.

Study group 8 – Concepts (SG8):

Austern reports there is still a plan to produce TS soon.

Study group 9 – Ranges (SG9):

Clow reports no activity in past few months.

Study group 10 – Feature Test (SG10):

Nelson reports for SG10.

Study group 11 – Databases (SG11):

Seymour reports for SG11.

Study group 12 – Undefined and Unspecified Behavior (SG12):

Dos Reis reports for SG12.

1.10 New business requiring actions by the committee

Sutter says there had been interested in graphics. He will create a SG unless there is a reason to put it in LEWG. SG13 will be chaired by Sutter and will have its first meeting Saturday Morning.

2 Organize Working Groups and Study Groups, establish working procedures

3 WG and SG sessions

Monday 23 September until 17:30

4 WG and SG sessions continue

Tuesday 24 September 8:30 – 17:30

5 WG and SG sessions continue

Wednesday 25 September 8:30 – 17:30

6 WG and SG sessions continue

Thursday 26 September 8:30 – 17:30

7 WG and SG sessions continue

Friday 27 September 8:30 – 12:00

8 General session

Friday 27 September 13:30 – 17:30

8.1 WG and SG status and progress reports

Core working group (CWG):

Miller presents CWG report.

CWG motion 1 passes with unanimous consent.

CWG motion 2 passes with unanimous consent.

CWG motion 3 passes with unanimous consent.

straw poll: CWG motion 4

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	20	0	3
WG21	unanimous consent		

CWG motion 4 passes.

straw poll: CWG motion 5

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	13	0	9
WG21	unanimous consent		

CWG motion 5 passes.

Library working group (LWG):

Meredith presents LWG report.

LWG motion 1 passes with unanimous consent.

LWG motion 2 passes with unanimous consent.

LWG motion 3 passes with unanimous consent.

LWG motion 4 passes with unanimous consent.

LWG motion 5 passes with unanimous consent.

straw poll: LWG motion 6

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	8	7	7
WG21	4	2	2

LWG motion 6 fails with no consensus.

straw poll: LWG motion 7

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	18	0	5
WG21	unanimous consent		

LWG motion 7 passes.

LWG motion 8 passes with unanimous consent.

straw poll: LWG motion 9

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous consent		
WG21	7	1	0

Straw poll: move nothing (status quo)

	<u>++</u>	<u>+</u>	<u>=</u>	<u>-</u>	<u>--</u>
PL22.16	0	0	1	15	4
WG21	0	0	0	5	3

Straw poll: move only dynarray to TS

	<u>++</u>	<u>+</u>	<u>=</u>	<u>-</u>	<u>--</u>
PL22.16	6	4	3	5	3
WG21	1	0	1	4	2

Straw poll: move both to TS

	<u>++</u>	<u>+</u>	<u>=</u>	<u>-</u>	<u>--</u>
PL22.16	8	7	4	1	1

WG21	5	3	0	0	0
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- Meanings for the above columns are usual in WG21 straw polls: ++ strongly in favor, + weakly in favor, = neutral, - weakly against, -- strongly against.

LWG motion 11 passes with unanimous consent.

Evolution working group (EWG):

Stroustrup reports EWG did a lot of work, but no motions.

Library Evolution working group (LEWG):

Yasskin reports for LEWG.

LEWG motion 1 passes with unanimous consent.

LEWG motion 2 passes with unanimous consent.

LEWG motion 3 passes with unanimous consent.

LEWG motion 4 passes with unanimous consent.

Study group 1 – Concurrency (SG1):

Boehm presents SG1 report.

SG1 motion 1 passes with unanimous consent.

SG1 motion 2 passes with unanimous consent.

Study group 2 – Modules (SG2):

Gregor reports SG2 has not met yet.

Study group 3 – File System (SG3):

Dawes reports there is a bit of work left with FS.

Study group 4 – Networking (SG4):

Kloepper reports progress made during the week.

Study group 5 – Transactional Memory (SG5):

Wong reports progress made this week.

Study group 6 – Numerics (SG6):

Crowl reports there is ongoing work and no paper approved yet.

Study group 7 – Reflection (SG7):

Carruth reports SG7 have not yet met.

Study group 8 – Concepts (SG8):

Austern reports.

Study group 9 – Ranges (SG9):

Clow reports.

Study group 10 – Feature Test (SG10):

Nelson reports that they have not met, but N3745 was discussed in EWG. Passed through. There was a plan to have WG21 approve it. Plan was to get a straw poll of everyone in room to give it some sort of cachet, but we are going to have to work it over a bit.

Sutter observes that there is more work for SG10 to do and it will be a living document. It seems you want an informal document and blessing of the room that we think that is a right idea. It is a standing document of the SG. Not normative.

Straw poll: move nothing (status quo)

++	+	=	-	--
lots	lots	1	0	0

Study group 11 – Databases (SG11):

Seymour reports SG11 did not meet.

Study group 12 – Undefined and Unspecified Behavior (SG12):

Dos Reis reports SG12 met from 8:40-10:20 yesterday.

Study group 13 – Graphics (SG13):

Sutter reports on SG13.

8.2 Presentation and discussion of proposals. Straw votes taken.

Straw votes take place with reports in 8.1.

9 WG and SG sessions continue

10 WG and SG sessions continue

Saturday 28 September 8:30 – 12:00

11 Review of the meeting

Saturday 28 September 13:30 – 17:30

Summary of motion results:

<u>Core</u>	<u>result</u>
CWG 1	carried
CWG 2	carried
CWG 3	carried
CWG 4	carried
CWG 5	carried

<u>Library</u>	
LWG 1	carried
LWG 2	carried

LWG 3 carried
LWG 4 carried
LWG 5 carried
~~LWG 6~~ removed
LWG 7 carried
LWG 8 carried
LWG 9 carried
LWG 10 carried
LWG 11 carried

Library Evolution

LEWG 1 carried
LEWG 2 carried
LEWG 3 carried
LEWG 4 carried

Concurrency

SG1 1 carried
SG1 2 carried

11.1 WG21 motions

Core motions:

CWG motion 1: Move we accept as Defect Reports all issues in "ready" status from [N3713](#) except for [1629](#) and apply their proposed resolutions to the C++ working paper: [1287](#) [1307](#) [1417](#) [1567](#) [1575](#) [1583](#) [1608](#) [1648](#)
Moved by: William Miller
Seconded by: Marshal Clow

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

CWG motion 2: Move we accept as Defect Reports all issues in "tentatively ready" status from [N3713](#) except for [1611](#) and apply their proposed resolutions to the C++ working paper: [1424](#) [1460](#) [1508](#) [1509](#) [1514](#) [1551](#) [1562](#) [1569](#) [1570](#) [1576](#) [1587](#) [1592](#) [1593](#) [1595](#) [1601](#) [1618](#) [1649](#)
Moved by: William Miller
Seconded by: Barry Hedquist

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

CWG motion 3: Move we apply [N3760](#), "[[deprecated]] attribute," to the C++ working paper.

Moved by: William Miller

Seconded by: Chandler Carruth

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

CWG motion 4: Move we apply [N3781](#), "Single-Quotation-Mark as a Digit Separator," to the C++ working paper.

Moved by: William Miller

Seconded by: Bjarne Stroustrup

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	22	0	2
WG21	unanimous	consent	

CWG motion 5: Move we apply [N3778](#), "C++ Sized Deallocation," to the C++ working paper.

Moved by: William Miller

Seconded by: Barry Hedquist

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	11	5	7
WG21	unanimous	consent	

Library motions:

LWG motion 1: Move we apply the resolutions of the following issues in "Ready" status from [N3754](#) to the C++ Working Paper:

[LWG2141](#) (common_type trait produces reference types)

[LWG2235](#) (Undefined behavior without proper requirements on basic_string constructors)

[LWG2246](#) (unique_ptr assignment effects w.r.t. deleter)

[LWG2247](#) (Type traits and std::nullptr_t)

Moved by: Alisdair Meredith

Seconded by: Marshal Clow

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

LWG motion 2: Move we apply the resolutions of the following issues in "Tentatively Ready" status from [N3754](#) to the C++ Working Paper:

[LWG2085](#) Wrong description of effect 1 of `basic_istream::ignore`

[LWG2087](#) `iostream_category()` and `noexcept`

[LWG2143](#) `ios_base::xalloc` should be thread-safe

[LWG2150](#) Unclear specification of `find_end`

[LWG2180](#) Exceptions from `std::seed_seq` operations

[LWG2194](#) Impossible container requirements for adaptor types

Moved by: Alisdair Meredith

Seconded by: Nevin Liber

yes no abstain

PL 22.16 unanimous consent

WG21 unanimous consent

LWG motion 3: Move we apply the resolutions of the following issues in document [N3788](#) to the C++ Working Paper:

[LWG 2013](#) Do library implementers have the freedom to add `constexpr`?

[LWG 2018](#) `regex_traits::isctype` Returns clause is wrong

[LWG 2078](#) Throw specification of `async()` incomplete

[LWG 2097](#) `packaged_task` constructors should be constrained

[LWG 2100](#) Timed waiting functions cannot timeout if `launch::async` policy used

[LWG 2120](#) What should `async` do if neither 'async' nor 'deferred' is set in policy?

[LWG 2159](#) `atomic_flag` initialization

[LWG 2275](#) Why is `forward_as_tuple` not `constexpr`?

[LWG 2284](#) Inconsistency in `allocator_traits::max_size`

[LWG 2298](#) `is_nothrow_constructible` is always false because of `create<>`

[LWG 2300](#) Redundant sections for `map` and `multimap` members should be removed

Moved by: Alisdair Meredith

Seconded by: Marshal Clow

yes no abstain

PL 22.16 unanimous consent

WG21 unanimous consent

LWG motion 4: Move we apply the proposed resolutions of the following National Body comments, as described in [n3733](#), to the C++ Working Paper:

GB 7 missing table reference

ES 15 unused table reference

GB 9 remove gets from library
Moved by: Alisdair Meredith
Seconded by: Roger Orr

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

LWG motion 5: Move we apply to the Working Paper the Proposed Wording from [N3779](#), "User-defined Literals for std::complex."
Moved by: Alisdair Meredith
Seconded by: Bjarne Stroustrup

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	21	0	2
WG21	unanimous	consent	

~~LWG motion 6:~~ Move we apply to the Working Paper the Proposed Wording from [N3775](#), "Deprecating rand() and Friends."
Moved by: Alisdair Meredith
Seconded by:

[motion removed]

LWG motion 7: Move we apply to the Working Paper the Proposed Wording from [N3789](#), "Constexpr Library Additions: functional."
Moved by: Alisdair Meredith
Seconded by: Marshal Clow

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

LWG motion 8: Move we direct the Networking TS project editor to produce a Working Paper based on [N3783](#), "Network Byte Order Conversion."
Moved by: Alisdair Meredith
Seconded by: Kyle Kloepper

	<u>yes</u>	<u>no</u>	<u>abstain</u>
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PL 22.16 unanimous consent
WG21 unanimous consent

LWG motion 9: Move we create a Working Paper for the planned Library Fundamentals TS, remove the edits applied to the C++14 CD by [N3672](#), "A proposal to add a utility class to represent optional objects", and direct the Library Fundamentals TS project editor to apply those words to the Library Fundamentals Working Paper as its initial content.

Moved by: Alisdair Meredith

Seconded by: Jeffery Yasskin

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	18	1	5
WG21	7	1	0

LWG motion 10: Move we create a Working Paper for a planned Array Extensions TS, remove the edits applied to the C++14 CD by the two papers

[N3639](#), "Runtime-sized arrays with automatic storage duration (revision 5)"

[N3662](#), "C++ Dynamic Arrays (dynarray)"

and direct the Array Extensions TS project editor to apply those words to the Array Extensions Working Paper as its initial content.

Moved by: Alisdair Meredith

Seconded by: Nevin Liber

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	18	0	6
WG21	unanimous consent		

LWG motion 11: Move we request the Convener to advance the Filesystem TS Working Paper to SC22 for PDTS Ballot.

Moved by: Alisdair Meredith

Seconded by: Roger Orr

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous consent		
WG21	unanimous consent		

Library evolution motions:

LEWG motion 1: Move to direct the Convener to request a New Work Item for a Technical Specification on Library Fundamentals.

Moved by: Jeffrey Yasskin

Seconded by: Marshal Clow

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

LEWG motion 2: Move to direct the Convener to request a New Work Item for a Technical Specification on Array Extensions.

Moved by: Jeffrey Yasskin

Seconded by: Barry Hedquist

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

LEWG motion 3: Move to direct the Convener to request a New Work Item for a Technical Specification on C++ extensions for parallelism.

See [N3724](#) for some indication of content.

Moved by: Jeffrey Yasskin

Seconded by: Pablo Halpern

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

LEWG motion 4: Move to direct the Convener to request a New Work Item for a Technical Specification on C++ extensions for concurrency.

See [N3731](#) and [N3721](#) for some indication of content.

Moved by: Jeffrey Yasskin

Seconded by: Hans Boehm

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

Concurrency motions:

SG1 motion 1: Move to apply [N3786](#): Prohibiting "out of thin air" results in C++14, to the C++ working paper.

Moved by: Hans Boehm

Seconded by: Michael Wong

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

SG1 motion 2: Move that we apply [N3776](#), Wording for ~future, to the C++ working paper.

Moved by: Hans Boehm

Seconded by: Chandler Carruth

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	
WG21	unanimous	consent	

Other motions:

11.2 PL22.16 motions

PL22.16 motion 1: PL22.16 designates the following members of PL22.16 as the US delegation to JTC1 SC22/WG21 for any and all WG21 meetings and teleconferences for calendar year 2014.

- Barry Hedquist, Perennial
- Steve Clamage, Oracle
- William 'Mike' Miller, Edison Design Group
- Howard Hinnant, Apple Computer
- Walter Brown, Member Emeritus
- Thomas Plum, Plum Hall
- Bjarne Stroustrup, Texas A&M University
- Clark Nelson, Intel.

Moved by: Barry Hedquist

Seconded by: Steve Clamage

	<u>yes</u>	<u>no</u>	<u>abstain</u>
PL 22.16	unanimous	consent	

11.3 Review of action items, decisions made, and documents adopted by the committee

11.4 Issues delayed until today

12 Plans for the future

12.1 Next and following meetings

Sutter talks about next and following meetings. Directs people to [isocpp.org upcoming meetings](http://isocpp.org/upcoming-meetings).

There is a discussion about meeting duration and voting schedule that ends with a straw poll:

Straw poll: should the meeting schedule be changed?

<u>change</u>	<u>no change</u>
7	lots

Sutter says we are staying with what we have.

12.2 Mailings

Nelson presents upcoming mailing deadlines.

post-meeting: October 11

pre-Issaquah: January 17

13 Adjournment

Motion: to adjourn
Moved by: Clark Nelson
Seconded by: Marshal Clow

Unanimous consent.

Adjourned Saturday 28 September at 2:49 p.m. CST (19:49 UTC).

14 Attendance

14.1 PL22.16 members

Principal representative designated with *.

Organization	Representative	M	T	W	R	F	S
Apple	Howard E. Hinnant*	✓	✓	✓	✓	✓	✓
Apple	Doug Gregor	✓	✓	✓	✓	✓	✓
Bloomberg	John Lakos*	✓	✓	✓	✓	✓	
Bloomberg	Alisdair Meredith	✓	✓	✓	✓	✓	✓
Bloomberg	Dietmar Kühl	✓	✓	✓	✓	✓	✓

Cisco Systems	Martin Sebor*	✓	✓	✓	✓	✓	
Dinkumware	P.J. Plauger*	✓	✓	✓	✓	✓	✓
Dinkumware	Tana Plauger	✓	✓				✓
DRW Holdings	Nevin Liber*	✓	✓	✓	✓	✓	✓
DRW Holdings	Brian Mehaffey	✓					
DRW Holdings	Thomas Rodgers	✓	✓	✓	✓		
DRW	Derek Groothuis	✓					
Edison Design Group	Daveed Vandevorde	✓	✓	✓	✓	✓	✓
Edison Design Group	Jens Maurer	✓	✓	✓	✓	✓	✓
Edison Design Group	John H. Spicer*	✓	✓	✓	✓	✓	✓
Edison Design Group	William M. Miller	✓	✓	✓	✓	✓	✓
Embarcadero Technologies	Dawn Perchik*	✓	✓	✓	✓	✓	✓
Gimpel Software	James Widman	✓	✓	✓	✓	✓	✓
Google	James Dennett	✓	✓	✓	✓	✓	✓
Google	Matthew Austern*	✓	✓	✓	✓	✓	✓
Google	Chandler Carruth	✓	✓	✓	✓	✓	✓
Google	Jeffery Yasskin	✓	✓	✓	✓	✓	✓
Google	Richard Smith	✓	✓	✓	✓	✓	✓
Hewlett-Packard Development	Hans Boehm	✓	✓	✓	✓	✓	✓
IBM	Michael Wong*	✓	✓	✓	✓	✓	✓
IBM	Hubert Tong	✓	✓	✓	✓	✓	✓
Indiana University	Larisse Voufo	✓	✓	✓	✓	✓	✓
Intel	Clark Nelson*	✓		✓	✓	✓	✓
Intel	Pablo Halpern	✓	✓	✓	✓	✓	✓
Intel	Robert Geva	✓	✓	✓	✓	✓	
Intel	Arch Robison	✓	✓	✓	✓	✓	✓
Intel	Tatiana Shpeisman	✓	✓	✓	✓	✓	✓
Louisiana State University	Hartmut Kaiser	✓	✓	✓			
Microsoft	Jonathan Caves*	✓	✓	✓	✓	✓	✓
Microsoft	Herb Sutter	✓	✓	✓	✓	✓	✓
Microsoft	Artur Laksberg	✓	✓	✓	✓	✓	
Microsoft	Niklas Gustafsson	✓	✓	✓	✓	✓	✓
Microsoft	Stephan Lavavej	✓	✓	✓	✓	✓	✓
Microsoft	Gabriel Dos Reis	✓	✓	✓	✓	✓	✓
NVidia	Olivier Giroux	✓	✓	✓	✓	✓	✓
NVidia	Jared Hoberock	✓	✓	✓	✓	✓	
NVidia	Michael Garland					✓	✓
Oracle	Paolo Carlini*	✓	✓	✓	✓	✓	✓

Oracle	Stephen D. Clamage	✓	✓	✓	✓	✓	✓
Oracle	Victor Luchangco	✓	✓	✓	✓	✓	
Perennial	Barry Hedquist*	✓				✓	✓
Perennial	Beman G. Dawes	✓	✓	✓	✓	✓	✓
Plum Hall	Thomas Plum*	✓	✓	✓	✓	✓	
Programming Research Group	Christof Meerwald	✓	✓	✓	✓	✓	✓
Qualcomm	Marshall Clow*	✓	✓	✓	✓	✓	✓
Rebar Systems	Juan Alday*	✓	✓	✓	✓	✓	
Red Hat	Jason Merrill*	✓	✓	✓	✓	✓	✓
Red Hat	Torvald Riegel	✓	✓	✓	✓	✓	✓
Riverbed	Kyle Kloepper*	✓	✓	✓	✓	✓	✓
Riverbed	Bob Kuo	✓	✓				
Seymour	Bill Seymour*	✓	✓		✓	✓	✓
Symantec	Mike Spertus*	✓	✓		✓	✓	✓
Datasift	Dinka Ranns	✓	✓	✓	✓	✓	✓
Texas A&M University	Bjarne Stroustrup*	✓	✓	✓	✓	✓	✓
University of Akron	Andrew Sutton	✓	✓	✓			

14.2 PL22.16 non-members

Organization	Representative	M	T	W	R	F	S
CryptoTec	Mikael Kilpeläinen	✓	✓	✓	✓	✓	✓
Frankfurt Inst. for Adv. Studies	Matthias Kretz	✓	✓	✓	✓	✓	✓
Goldman Sachs	Jeff Snyder	✓	✓	✓	✓	✓	✓
HSR	Peter Sommerlad	✓	✓	✓	✓	✓	✓
BlackBerry	Tony Van Eerd	✓	✓	✓	✓	✓	✓
Roundhouse Consulting	Pete Becker	✓	✓	✓	✓	✓	✓
think-cell Software	Fabio Fracassi	✓	✓	✓	✓	✓	✓
TU Dresden	Peter Gottschling	✓		✓	✓	✓	✓
University Carlos III	J. Daniel Garcia	✓	✓	✓	✓	✓	✓
University of Nice	Jean-Paul Rigault	✓	✓	✓	✓	✓	✓
Vollmann Engineering	Detlef Vollmann	✓	✓	✓	✓	✓	✓
	Nicolai Josuttis	✓	✓	✓	✓	✓	✓
	Ville Voutilainen	✓	✓	✓	✓	✓	✓
	Roger Orr	✓	✓	✓	✓	✓	✓
	Andrew Sandoval		✓	✓			
	Eugene Yakubovich	✓	✓	✓	✓	✓	
	Faisal Vali	✓	✓	✓	✓	✓	
	Gene Panov	✓	✓	✓			

	Lawrence Crowl	✓	✓	✓	✓	✓	✓
WMS Gaming	Michael Bytnar	✓	✓	✓	✓	✓	
	Nat Goodspeed		✓	✓	✓		
Mozilla	Botond Ballo	✓	✓	✓	✓	✓	✓
KCG	Robert Douglas	✓	✓	✓	✓		
3Red	Robert Zeh	✓	✓	✓	✓	✓	
	Walter E. Brown	✓	✓	✓	✓	✓	✓
	Zihao Yuan	✓	✓	✓	✓	✓	
	Michael Kristofik	✓					
	Ari Levin	✓					
	Nathan Wilson	✓	✓		✓		
Argonne National Lab	Hal Finkel	✓	✓	✓	✓	✓	✓
	Jayson Oldfather	✓	✓	✓	✓	✓	
KCG	Jay Miller	✓					
	Jason Zink						✓
	Michael McLaughlin						✓
	Stefanus Du Toit	✓	✓	✓	✓	✓	✓

14.3 JTC1/SC22/WG21 technical experts

Heads of delegation designated with *.

Affiliation	Representative
Netherlands	Bjarne Stroustrup*
Canada	Michael Wong*
Canada	Stefanus Du Toit
United States	Barry Hedquist*
Germany	Nicolai Josuttis
Germany	Peter Gottschling*
Switzerland	Peter Sommerlad
Switzerland	Detlef Vollmann*
Spain	J. Daniel Garcia*
United Kingdom	Jeff Snyder
United Kingdom	Roger Orr*
Finland	Ville Voutilainen*
Finland	Mikael Kilpeläinen