

# PL22.16 2014-11 Urbana Minutes (Final)

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ISO/IEC JTC1 SC22 WG21 N4497 - 2015-05-30

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PL22.16 Meeting No. 64  
November 3-8, 2014 – Urbana-Champaign, IL, USA

The following members attained voting status in this meeting:

- Lexmark International
- Morgan Stanley

This document revises [N4252](#) correcting the omission of the details of LWG Motion 18.

## 1. Opening activities

Monday, November 3, 9:00am–noon

Clamage opened the meeting at 9:00am.

### 1.1 Opening comments, welcome from host

### 1.2 Introductions

### 1.3 Meeting guidelines (INCITS Patent and Anti-Trust policies)

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

<http://www.incits.org/dotAsset/63b6e457-53b9-4933-9835-7c74e77ca2fd.pdf>

(ISO meeting guidelines)

[http://www.iso.org/iso/codes\\_of\\_conduct.pdf](http://www.iso.org/iso/codes_of_conduct.pdf)

Clamage pointed to the policies and instructed interested people to take a look at them.

### 1.4 Membership, voting rights, and procedures for the meeting

### 1.5 Agenda review and approval

Motion to adopt the agenda in N3979, moved by Clow, seconded by Dawes.

The motion to adopt the agenda in N4122 was unanimously approved.

### 1.6 Approval of the minutes of the previous meeting

Motion to adopt the minutes of the previous meeting in N4054, moved by Carruth, seconded by

Clow.

Motion to adopt the minutes of the previous meeting in N4054 was unanimously approved.

### **1.7 Editors' reports, approval of drafts (C++ Standard, and TS's)**

N4140, C++ Working Draft, was unanimously approved.

N4081, Library Fundamentals Working Draft, was unanimously approved.

N4084, Library Fundamentals v2 Working Draft, was unanimously approved.

N4099, Filesystem Working Draft, was unanimously approved.

N4104, Parallelism Working Draft, was unanimously approved.

N4107, Concurrency Working Draft, was unanimously approved.

### **1.8 Liaison reports, and WG21 study group reports**

There is no WG14 liaison report. Plum explained that the CPLEX meeting was canceled, and that WG14 worked on defect reports.

Sutter explained that the Technical Specification (TS) on Library Fundamentals and the TS on Parallelism are aiming for PDTS ballot resolution during the meeting. NWIP expected for the second version of Library Fundamentals. Concurrency is aiming for PDTS, as is Concepts.

Meredith pointed out that in order to gain the benefit of experience of a TS, it looks like File System, Library Fundamentals (v1), and Parallelism can hit C++17, he thinks that C++20 is the target for most others. Stroustrup thought that's too much caution. Carruth thought that the discussion should be had in WGs rather than the plenary. Sutter pointed out that the parallel tracks give us flexibility with regards to making the decision.

### **1.9 WG progress reports and work plans for the week**

Each group reported their status.

### **1.10 New business requiring actions by the committee**

None.

## **2. Organize Working Groups and Study Groups, establish working procedures.**

### **3-7. WG and SG sessions.**

Monday, November 3 from afternoon break until 5:30pm. From Tuesday, November 4 to Thursday, November 6 8:30am-5:30pm. Friday, November 7 8:30am-noon.

## **8. General session**

Friday, November 7, 1:30pm–5:30pm

## **8.1 WG and SG status and progress reports.**

Miller presented the CWG report.

Meredith presented the LWG report.

Yasskin gave the LEWG report.

Voutilainen gave the EWG report.

Crowl summarized SG1 (Concurrency) progress.

Voutilainen summarized SG2 (Modules) progress.

Dawes summarized SG3 (Filesystem) progress.

Wong summarized SG5 (Transactional Memory) progress.

Crowl summarized SG6 (Numerics) progress.

Carruth summarized (SG7, Reflection) progress.

Austern summarized (SG8, Concepts) progress.

Clow summarized (SG9, Ranges) progress.

Nelson summarized SG10 (Feature Test) progress.

Dos Reis summarized SG13 (Undefined Behavior) progress.

Sutter summarized SG14 (I/O) progress.

## **8.2 Presentation and discussion of proposals. Straw votes taken.**

### **CWG Motions**

**Straw poll, CWG Motion 1, Move to accept as Defect Reports the following issues from N4192 (all issues in "ready" status except 314, 343, 1299, 1584, 1710, 1794, 1812, and 1817) and apply their proposed resolutions to the C++ working paper:**

**393 591 609 1292 1338 1351 1356 1397 1446 1465 1467 1484 1490 1492 1552 1558 1571 1572  
1573 1589 1591 1596 1600 1603 1614 1615 1631 1633 1639 1651 1686 1694 1705 1708 1712  
1744 1748 1750 1751 1752 1753 1756 1757 1758 1766 1777 1779 1780 1782 1791 1793 1796  
1797 1799 1800 1802 1804 1805 1806 1809 1810 1814 1816 1823 1824 1830 1832 1834 1843  
1846 1850 1851 1852 1877 1892 1893 1911 1940**

CWG Motion 1 was approved by unanimous consent.

**Straw poll, CWG Motion 1, Move to accept as Defect Reports all issues in "tentatively ready" status from N4192, as well as 987 (previously in "open" status but resolved by 1838), and apply their proposed resolutions to the C++ working paper:**

**987 1021 1630 1672 1696 1719 1774 1788 1795 1807 1811 1813 1815 1819 1838 1848 1858 1865  
1866 1870 1874 1878 1881 1882 1885 1887 1891 1902 1909**

CWG Motion 2 was approved by unanimous consent.

**Straw poll, CWG Motion 3, Move to create a working paper for the Technical Specification on C++ Extensions for Transactional Memory with N4272, "Technical Specification on C++ Extensions for Transactional Memory, Working Draft Header" and N4265, "Transactional Memory Support for C++: Wording (revision 3)" as its initial content.**

CWG Motion 3 was approved by unanimous consent.

**Straw poll, CWG Motion 4, Move to appoint a review committee composed of Jens Maurer, Alisdair Meredith, and William M. (Mike) Miller to approve the correctness of the C++ Transactional Memory working paper as created by the preceding motion, and to direct the Convener to transmit the approved working paper to SC22 for PDTS ballot.**

CWG Motion 4 was approved by unanimous consent.

**Straw poll, CWG Motion 5, Move to apply to the C++ working paper the proposed wording from N4259, "Wording for `std::uncaught_exceptions`".**

CWG Motion 5 was approved by unanimous consent.

**Straw poll, CWG Motion 6, Move to apply to the C++ working paper the proposed wording from N4261, "Proposed resolution for Core Issue 330: Qualification conversions and pointers to arrays of pointers".**

CWG Motion 6 was approved by unanimous consent.

**Straw poll, CWG Motion 7, Move to apply to the C++ working paper the proposed wording from N4262, "Wording for Forwarding References".**

CWG Motion 7 was approved by unanimous consent.

**Straw poll, CWG Motion 8, Move to apply to the C++ working paper the proposed wording from N4266, "Attributes for namespaces and enumerators".**

CWG Motion 8 was approved by unanimous consent.

**Straw poll, CWG Motion 9, Move to apply to the C++ working paper the proposed wording from N4267, "Adding `u8` character literals".**

CWG Motion 9 was approved by unanimous consent.

**Straw poll, CWG Motion 10, Move to apply to the C++ working paper the proposed wording from N4268, "Allow constant evaluation for all non-type template arguments".**

CWG Motion 10 was approved by unanimous consent.

**Straw poll, CWG Motion 11, Move to apply to the C++ working paper the proposed wording from N4230, "Nested namespace definition (revision 2)".**

CWG Motion 11 was approved by unanimous consent.

**Straw poll, CWG Motion 12, Move to apply to the C++ working paper the proposed wording from N4285, "Cleanup for *exception-specification* and *throw-expression*".**

CWG Motion 12 was approved by unanimous consent.

**Straw poll, CWG Motion 13, Move to apply to the C++ working paper the proposed wording from N4295, "Folding expressions".**

CWG Motion 13 straw poll results were:

In favor: 42 Opposed: 7 Abstain: 14

US PL22.16 members: In favor: 15 Opposed: 3 Abstain: 7

Sutter declared consensus, motion approved.

**Straw poll, CWG Motion 14, Move to apply to the C++ working paper the proposed wording from N3928, "Extending `static_assert`, v2"**

CWG Motion 14 was approved by unanimous consent.

**Straw poll, CWG Motion 15, Move to apply to the C++ working paper the proposed wording from N3994, "Range-Based For-Loops, The Next Generation (Revision 1)"**

CWG Motion 13 straw poll results were:

In favor: 8 Opposed: 43 abstain: 18

Motion not carried.

The motion was removed from the formal motions page.

**Straw poll, CWG Motion 16, Move to apply to the C++ working paper the proposed wording from N3922, "New Rules for auto deduction from *braced-init-list*"**

CWG Motion 16 straw poll results were:

In favor: 25 Opposed: 5 abstain: 36

Sutter declared consensus, motion approved.

**Straw poll, CWG Motion 17, Move to apply to the C++ working paper the proposed wording from N4051, "typename/class"**

CWG Motion 17 was approved by unanimous consent.

**Straw poll, CWG Motion 18, Move to apply to the C++ working paper the proposed wording from N4086, "Removing trigraphs??!"**

CWG Motion 18 straw poll results were:

In favor: 57 Opposed: 2 Abstain: 10

Sutter declared consensus, motion approved.

## **LWG Motions**

**Straw poll, LWG Motion 1, Move we apply to the Parallelism TS Working Paper the Proposed Wording from N4275 Response to National Body comments for C++ Extensions for Parallelism.**

LWG Motion 1 was approved by unanimous consent.

**Straw poll, LWG Motion 2, Move we apply to the Parallelism TS Working Paper the Proposed Wording from N4276 Transform Reduce, an Additional Algorithm for C++ Extensions for Parallelism.**

LWG Motion 2 was approved by unanimous consent.

**Straw poll, LWG Motion 3, Move to apply to the Parallelism TS working paper the resolutions approved at the upcoming Parallelism PDTS ballot resolution teleconference meeting to any additional PDTS national body comments not already processed at this meeting.**

LWG Motion 3 was approved by unanimous consent.

**Straw poll, LWG Motion 4, Move to appoint an editing committee composed of Alisdair Meredith, Hans Boehm, and Lawrence Crowl to approve the correctness of the Parallelism working paper as modified by the motions approved at this meeting, and to direct the Convener to transmit the approved updated working paper for DTS ballot.**

LWG Motion 4 was approved by unanimous consent.

**Straw poll, LWG Motion 5, Move that we strike Clause 11 (Network Byte Order) and remove the reference to the Unicode standard RFC2781 from sub-clause 1.2 (Normative References) of the Library Fundamentals TS Working Paper.**

LWG Motion 5 was approved by unanimous consent.

**Straw poll, LWG Motion 6, Move we apply to the Library Fundamentals TS Working Paper the Proposed Wording from N4270, Collected Edits to the Library Fundamentals TS.**

LWG Motion 6 was approved by unanimous consent.

**Straw poll, LWG Motion 7, Move we apply to the Library Fundamentals TS Working Paper the Proposed Wording from N4288, Strike `string_view::clear` from the Library Fundamentals TS.**

LWG Motion 7 was approved by unanimous consent.

**Straw poll, LWG Motion 8, Move to apply to the Library Fundamentals TS working paper the resolutions approved at the upcoming Library Fundamentals PDTS ballot resolution teleconference meeting to any additional PDTS national body comments not already processed at this meeting.**

LWG Motion 8 was approved by unanimous consent.

**Straw poll, LWG Motion 9, Move to appoint an editing committee composed of Alisdair Meredith, Jeffrey Yasskin, and Nicolai Josuttis to approve the correctness of the Library Fundamentals working paper as modified by the motions approved at this meeting, and to direct the Convener to transmit the approved updated working paper for DTS ballot.**

LWG Motion 9 was approved by unanimous consent.

**Straw poll, LWG Motion 10, Move we apply the resolutions of the following issues in "Ready" status from N4245 to the C++ Working Paper:**

- 2170 Aggregates cannot be DefaultConstructible**
- 2016 Allocators must be no-throw swappable**
- 2340 Replacement allocation functions declared as inline**
- 2377 std::align requirements overly strict**
- 2399 shared\_ptr's constructor from unique\_ptr should be constrained**
- 2400 shared\_ptr's get\_deleter() should use addressof()**
- 2401 std::function needs more noexcept**
- 2396 underlying\_type doesn't say what to do for an incomplete enumeration type**
- 2408 SFINAE-friendly common\_type / iterator\_traits is missing in C++14**
- 2354 Unnecessary copying when inserting into maps with braced-init syntax**
- 2404 mismatch()'s complexity needs to be updated**

LWG Motion 10 was approved by unanimous consent.

**Straw poll, LWG Motion 11, Move we apply the resolutions of the following issues in "Tentatively Ready" status from N4245 to the C++ Working Paper:**

- 2129 User specializations of std::initializer\_list**
- 2212 tuple\_size for const pair request header**
- 2361 Apply 2299 resolution throughout library**
- 2376 bad\_weak\_ptr::what() overspecified**
- 2365 Missing noexcept in shared\_ptr::shared\_ptr(nullptr\_t)**
- 2387 More nested types that must be accessible and unambiguous**
- 2233 bad\_function\_call::what() unhelpful**
- 2266 vector and deque have incorrect insert requirements**
- 2230 "see below" for initializer\_list constructors of unordered containers**
- 2106 move\_iterator wrapping iterators returning prvalues**
- 2325 minmax\_element()'s behavior differing from max\_element()'s should be noted**
- 2217 operator==(sub\_match, string) slices on embedded '\0's**

LWG Motion 11 was approved by unanimous consent.

**Straw poll, LWG Motion 12, Move we apply to the C++ Working Paper the Proposed Wording from N4190, Removing auto\_ptr, random\_shuffle(), And Old <functional> Stuff.**

LWG Motion 12 straw poll results were:

In favor: 48 Opposed: 1 Abstain: 13

Sutter declared consensus, motion approved.

**Straw poll, LWG Motion 13, Move we apply to the C++ Working Paper the Proposed**

**Wording from N4284, Contiguous Iterators.**

LWG Motion 13 was approved by unanimous consent.

**Straw poll, LWG Motion 14, Move we apply to the C++ Working Paper the Proposed Wording from N4089, Safe conversions in `unique_ptr<T[]>`.**

LWG Motion 14 was approved by unanimous consent.

**Straw poll, LWG Motion 15, Move we apply to the C++ Working Paper the Proposed Wording from N4277, TriviallyCopyable `reference_wrapper`.**

LWG Motion 15 was approved by unanimous consent.

**Straw poll, LWG Motion 16, Move we apply to the C++ Working Paper the Proposed Wording from N4258, Cleaning-up `noexcept` in the Library.**

LWG Motion 16 was approved by unanimous consent.

**Straw poll, LWG Motion 17, Move we apply to the C++ Working Paper the Proposed Wording from N4279, Improved insertion interface for unique-key maps.**

LWG Motion 17 was approved by unanimous consent.

**Straw poll, LWG Motion 18, Move we apply to the C++ Working Paper the Proposed Wording from N3911, TransformationTrait Alias `void_t`.**

LWG Motion 18 was approved by unanimous consent.

**Straw poll, LWG Motion 19, Move we apply to the C++ Working Paper the Proposed Wording from N4169, A proposal to add `invoke` function template**

LWG Motion 19 was approved by unanimous consent.

**Straw poll, LWG Motion 20, Move we apply to the C++ Working Paper the Proposed Wording from N4280, Non-member `size()` and more**

LWG Motion 20 was approved by unanimous consent.

**Library Fundamentals 2 TS**

**Straw poll, LWG Motion 21, Move we apply to the Working Paper for the Library Fundamentals 2 TS the Proposed Wording from N4273, Uniform Container Erasure.**

LWG Motion 21 was approved by unanimous consent.

**Straw poll, LWG Motion 22, Move we apply to the Working Paper for the Library Fundamentals 2 TS the Proposed Wording from N4061, Greatest Common Divisor and Least Common Multiple.**



LWG Motion 22 was approved by unanimous consent.

**Straw poll, LWG Motion 23, Move we apply to the Working Paper for the Library Fundamentals 2 TS the Proposed Wording from N4257, Delimited iterators.**

LWG Motion 23 was approved by unanimous consent.

**Straw poll, LWG Motion 24, Move we apply to the Working Paper for the Library Fundamentals 2 TS the Proposed Wording from N4282, The World's Dumbest Smart Pointer.**

LWG Motion 24 straw poll results were:

In favor: 35 Opposed: 11 Abstain: 21

US PL22.16 members:

In favor: 16 Opposed: 3 Abstain: 4 US approves.

Sutter declared consensus, motion approved.

## **WG21 Motions**

**Move to direct the Convener to request a New Work Item for 14882 (C++).**

The motion was approved by unanimous consent.

## **9-10. WG and SG sessions continue**

Saturday, November 8, 8:30am-noon

## **11. Review of the meeting**

Clamage opened the meeting.

Clamage asked if anyone wants to reopen any of the straw polls for discussion of new information and to retake the poll. There were no requests, so the Friday motion approvals stand unchanged.

Clamage asked if there were any new reactions from PL22, Hedquist confirmed there were not.

### **11.1 WG21 motions**

### **11.2 PL22.16 motions**

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

### **11.4 Issues delayed until today**

No issues.

## 12. Plans for the future

### 12.1 Next and following meetings

Sutter summarized the forthcoming meetings.

### 12.2 Mailings

November 21 is the post-meeting mailing deadline, February 6 is the mid-meeting mailing deadline and April 10th is the pre-Lenexa deadline.

## 13. Adjournment

Meeting adjourned by unanimous consent.

## 14 Attendance

The column "WG21" designates official PL22.16 or WG21 status ("P", "A", "E", "M")

The column "PL22.16" indicates organizations eligible to vote by "V".

An "x" marks a day attended, for days unattended, the field is blank.

### 14.1 PL22.16 members

| Company/Organization     | NB | Representative     | M | T | W | R | F | S | WG21 | PL22.16 |
|--------------------------|----|--------------------|---|---|---|---|---|---|------|---------|
| AMD                      |    | Robin Maffeo       | x | x | x | x | x |   | P    | V       |
| Argonne National Lab     |    | Hal Finkel         | x | x | x | x | x | x | P    | V       |
| Bloomberg                |    | John Lakos         | x | x | x | x | x | x | P    | V       |
| Bloomberg                | UK | Alisdair Meredith  | x | x | x | x | x | x | A    |         |
| Bloomberg                | UK | Dietmark Kühl      | x | x | x | x | x | x | A    |         |
| Bloomberg                |    | Nathan Myers       | x | x | x |   |   |   |      |         |
| Brown                    |    | Walter Brown       | x | x | x | x | x | x | E    |         |
| CERT Coordination Center |    | Aaron Ballman      | x | x | x | x | x | x | P    | V       |
| Cisco Systems            |    | Martin Sebor       | x | x | x | x |   |   | P    | V       |
| Dinkumware               |    | P.J. Plauger       | x | x | x | x | x | x | P    | V       |
| Dinkumware               |    | Tana Plauger       | x | x | x | x | x | x | A    |         |
| DRW Holdings             |    | Nevin Liber        | x | x | x | x | x | x | P    | V       |
| DRW Holdings             |    | Thomas Rodgers     | x | x | x | x | x |   | A    |         |
| Edison Design Group      |    | John H. Spicer     | x | x | x | x | x | x | P    | V       |
| Edison Design Group      |    | Daveed Vandevoorde | x | x | x | x | x | x | A    |         |
| Edison Design Group      |    | Jens Maurer        | x | x | x | x | x | x | A    |         |

|                             |    |                    |   |   |   |   |   |   |   |   |
|-----------------------------|----|--------------------|---|---|---|---|---|---|---|---|
| Edison Design Group         |    | William M. Miller  | x | x | x | x | x | x | A |   |
| Embarcadero Technologies    |    | Dawn Perchik       | x | x | x | x | x | x | P | V |
| Flight Safety International |    | Billy Baker        | x | x | x | x | x | x | P | V |
| Gimpel Software             |    | James Widman       | x | x | x | x | x | x | A |   |
| Google                      |    | Matthew Austern    | x | x | x | x | x | x | P | V |
| Google                      |    | Chandler Carruth   | x | x | x | x | x | x | A |   |
| Google                      |    | Geoffrey Romer     | x | x | x | x | x | x | A |   |
| Google                      |    | Hans Boehm         | x | x | x | x |   |   | A |   |
| Google                      |    | James Dennett      | x | x | x | x | x |   | A |   |
| Google                      |    | Jeffrey Yasskin    | x | x | x | x | x | x | A |   |
| Google                      | CA | JF Bastien         | x | x | x | x | x | x | A |   |
| Google                      | UK | Richard Smith      | x | x | x | x | x | x | A |   |
| Google                      |    | Thomas Koeppe      | x | x | x | x | x | x | A |   |
| Google                      |    | Titus Winters      | x | x | x | x | x | x |   |   |
| GreenWireSoft               |    | Juan Alday         | x | x | x | x | x | x | P | V |
| IBM                         | CA | Michael Wong       | x | x | x | x | x | x | P | V |
| IBM                         |    | Paul E. McKenney   |   | x | x | x | x |   | A |   |
| IBM                         | CA | Hubert Tong        | x | x | x | x | x | x |   |   |
| IBM                         |    | Maged Michael      |   |   |   | x |   |   |   |   |
| Indiana University          |    | Larisse Voufo      | x |   |   |   |   |   | A |   |
| Intel                       |    | Clark Nelson       | x |   |   |   | x |   | P | V |
| Intel                       |    | Arch Robison       | x | x | x | x | x | x | A |   |
| Intel                       |    | Pablo Halpern      | x | x | x | x | x | x | A |   |
| Intel                       |    | Robert Geva        | x | x | x | x |   |   | A |   |
| KCG Holdings                |    | Robert Douglas     | x | x | x | x |   |   | P | V |
| Lawrence Livermore Holdings |    | Michael Kumbera    | x | x | x | x | x |   | P |   |
| Lexmark International       |    | Michael Price      | x | x | x | x | x |   | P | V |
| Louisiana State University  |    | Hartmut Kaiser     | x | x | x | x | x |   | P | V |
| Louisiana State University  |    | Agustin Berge      | x | x | x | x | x | x | A |   |
| Microsoft                   |    | Jonathan Caves     | x | x | x | x | x | x | P | V |
| Microsoft                   |    | Artur Laksberg     | x | x | x | x | x | x | A |   |
| Microsoft                   |    | Gabriel Dos Reis   | x | x | x | x | x | x | A |   |
| Microsoft                   |    | Herb Sutter        | x | x | x | x | x | x | A |   |
| Microsoft                   |    | Stephan T. Lavavej | x | x | x | x | x | x | A |   |

|                            |    |                    |   |   |   |   |   |   |   |   |
|----------------------------|----|--------------------|---|---|---|---|---|---|---|---|
| Microsoft                  |    | Gor Nishanov       | x | x | x | x | x | x |   |   |
| Morgan Stanley             |    | Bjarne Stroustrup  | x | x | x | x |   |   | P | V |
| NVidia                     |    | Jared Hoberock     | x | x | x | x |   |   | A |   |
| NVidia                     |    | Olivier Giroux     | x | x | x | x | x | x | A |   |
| Oracle                     |    | Fedor Sergeev      | x | x | x | x | x | x | A |   |
| Oracle                     |    | Stephen D. Clamage | x | x | x | x | x | x | A |   |
| Oracle                     |    | Victor Luchangco   |   |   | x | x |   |   | A |   |
| Perennial                  |    | Barry Hedquist     | x | x | x | x | x | x | P | V |
| Perennial                  |    | Beman G. Dawes     | x | x | x | x |   |   | A |   |
| Perennial                  |    | Lawrence Crowl     | x | x | x | x | x |   | A |   |
| Plum Hall                  |    | Thomas Plum        | x | x | x | x | x | x | P | V |
| Plum Hall                  | FI | Ville Voutilainen  | x | x | x | x | x | x | A |   |
| Programming Research Group |    | Christof Meervald  | x | x | x | x | x | x | A |   |
| Qualcomm                   |    | Marshall Clow      | x | x | x | x | x | x | P | V |
| Red Hat                    |    | Jason Merrill      | x | x | x | x | x | x | P | V |
| Red Hat                    | UK | Jonathan Wakely    | x | x | x | x | x | x | A |   |
| Red Hat                    |    | Torvald Riegel     | x | x | x | x | x | x | A |   |
| Riverbed Technology        |    | Oleg Smolsky       | x | x | x | x |   |   | P | V |
| Riverbed Technology        |    | Bob Kuo            | x |   |   |   |   |   | A |   |
| Sandia National Labs       |    | Carter Edwards     | x | x | x | x | x | x | P | V |
| Seymour                    |    | Bill Seymour       | x | x | x | x | x |   | P | V |
| Symantec                   |    | Mike Spertus       | x | x |   | x |   |   | P | V |

## 14.2 Other WG21 members

| Company/Organization  | NB | Representative       | M | T | W | R | F | S | WG21 | PL22.16 |
|-----------------------|----|----------------------|---|---|---|---|---|---|------|---------|
| Mozilla               | CA | Botond Ballo         | x | x | x | x | x | x | M    |         |
| Blackberry            | CA | Tony Van Eerd        | x |   |   |   |   |   | M    |         |
| CERN                  | CH | Axel Naumann         | x | x | x | x | x | x | M    |         |
| Vollmann Engineering  | CH | Detlef Vollmann      | x | x | x | x | x | x | M    |         |
| HSR                   | CH | Peter Sommerlad      | x | x | x | x | x | x | M    |         |
| think-cell Software   | DE | Fabio Fracassi       | x | x | x | x | x | x |      |         |
| University Carlos III | ES | J. Daniel Garcia     | x | x | x | x | x | x | M    |         |
| Cryptotec             | FI | Mikael Kilpeläinen   | x | x | x | x | x |   | M    |         |
|                       | UK | Christopher Kohlhoff | x | x | x | x | x | x | M    |         |

|              |    |              |   |   |   |   |   |   |   |  |
|--------------|----|--------------|---|---|---|---|---|---|---|--|
|              | UK | Dinka Ranns  | x | x | x | x | x | x | M |  |
| PDT Partners | UK | Jeff Snyder  | x | x | x | x | x | x | M |  |
|              | UK | Jonathan Coe | x | x | x |   | x |   | M |  |
|              | UK | Roger Orr    | x | x | x | x | x | x | M |  |

### 14.3 Participating non-members

| Company/Organization             | NB | Representative     | M | T | W | R | F | S | WG21 | PL22.16 |
|----------------------------------|----|--------------------|---|---|---|---|---|---|------|---------|
| University of Akron              |    | Andrew Sutton      | x | x | x | x | x | x |      |         |
| Kitware                          |    | Ben Boeckel        | x | x | x | x | x | x |      |         |
| University of Akron              |    | Braden Obrzut      | x | x | x | x | x | x |      |         |
| Taller Technologies              |    | Daniel Gutson      | x | x | x | x | x |   |      |         |
|                                  |    | Eric Kiselier      |   | x |   |   |   |   |      |         |
|                                  |    | Eric Niebler       | x | x | x | x |   |   |      |         |
|                                  |    | Faisal Vali        | x | x | x |   |   |   |      |         |
| Thomson Reuters                  |    | Gina Stephens      |   |   |   | x | x |   |      |         |
| Ripple Labs                      |    | Howard E. Hinnant  | x | x | x | x | x | x |      |         |
|                                  |    | John Wiegley       | x | x | x | x | x |   |      |         |
| Yahoo                            |    | Kyle Kloepper      | x | x |   |   |   |   |      |         |
|                                  |    | Maurd Bianco       | x | x | x | x |   |   |      |         |
| Frankfurt Inst. for Adv. Studies |    | Matthias Kretz     | x | x | x | x | x | x |      |         |
|                                  |    | Maurice Bos        | x | x | x | x |   |   |      |         |
| Bob Taco Industries              |    | Michael McLaughlin |   |   |   |   | x | x |      |         |
|                                  |    | Nat Goodspeed      | x | x | x | x | x |   |      |         |
|                                  |    | Nicolai Josuttis   | x | x | x | x | x | x |      |         |
| Roundhouse Consulting            |    | Pete Becker        | x | x | x | x | x |   |      |         |
|                                  |    | Roman Zulak        | x |   |   |   |   |   |      |         |
|                                  |    | Sjors Gielen       | x | x | x | x |   |   |      |         |
|                                  |    | Zhihao Yuan        | x | x | x | x |   |   |      |         |