Draft Minutes for PL22.3 (J3) Meeting 218

Document No. PL22.3-2019-00102-draft-minutes

Document Date:	February 21, 2019
Reply To:	Dan Nagle
Subject:	Draft Minutes of INCITS PL22.3 Working group for Fortran February 11-15, 2019 (8:00AM – 5:00PM Pacific), In-person

1. Administrative

1.1 Call to Order and Chairman's Remarks   February 11, 2019 8:00 AM by the chairman, Dan Nagle. Lorri Menard acted as Recording Secretary.

1.2 INCITS Patent Policy and Antitrust
Reference: http://www.incits.org/standards-information/legal-info

1.3 Membership Report

1.3.1 Member organizations:
(Note: Voting members are "YES;" non-voting but attending are "yes")

Company	First Name	Participant Class	Membership Class	In Attendance
Corbett	Robert Corbett	Principal	Voting	YES
Cray Inc	Bill Long	Principal	Voting	YES
IBM Corporation	Daniel Chen	Principal	Voting	YES
	Kelvin Li	Alternate	Voting	
	Rafik Zurob	Alternate	Voting	
Intel Corporation	Raghu Maddhipatla	Alternate	Voting	
	Divya Mangudi	Alternate	Voting	
	Lorri Menard	Principal	Voting	YES
	Jon Steidel	Alternate	Voting	yes
Jet Propulsion Laboratory	Van Snyder	Principal	Voting	YES
Kernelyze LLC	Thomas Knox	Principal	Voting	
Lawrence Berkeley National Laboratory	Bryce Adelstein-Lelbach	Principal	Voting	

	Brian Friesen	Alternate	Voting	YES
Lionel	Steve Lionel	Principal	Voting	YES
	Malcolm Cohen	Alternate	Voting	yes
	Vipul Parekh	Alternate	Voting	yes
NASA	Thomas Clune	Principal	Voting	YES
	Henry Jin	Alternate	Voting	
National Center for Atmospheric Research (NCAR)	Dan Nagle	Principal	Voting	YES
	John Reid	Alternate	Voting	
	John Wallin	Alternate	Voting	
NVidia Corporation	Gary Klimowicz	Principal	Voting	YES
	Mark LeAir	Alternate	Voting	
United States Dept of Energy	Aleksandar Donev	Alternate	Voting	
	Karla Morris	Principal	Voting	
	Damian Rouson	Alternate	Voting	YES
	Craig Rasmussen	Guest		yes
Oak Ridge National Labs	David E. Berhnoldt	Principal	Voting	
	Reuben Budiardja		observer	
Guests	Srinath Vadlamani Ondrej Certik Craig Rasmussen	ARM Los Alamos Lawrence Livermore	Guests	

1.3.2   Member organizations with voting rights:
There are 12 member organizations with voting rights, and one organization that is pending (Oak Ridge National Labs). The pending organization has not yet completed the prerequisite observation meeting, although that will happen at this meeting.
Eleven of the 12 voting organizations are represented at this meeting.

1.3.3   Member organizations gaining voting rights at this meeting:
Oak Ridge will gain voting rights at this meeting

1.3.4   Member organizations that have lost voting rights due to lack of attendance:
No organizations have lost voting rights due to attendance

       1.3.5   Member organizations in attendance jeopardy:
                No organizations are in attendance jeopardy

       1.3.6   Member organizations in ballot jeopardy:
                DOE is in ballot jeopardy

1.4   Approval of Previous Meeting Minutes
Reference:
https://standards.incits.org/apps/org/workgroup/pl22.3/download.php/103319/pl22.3-2018-00285-PL22.3%20minutes%20for%20m217.docx

Motion to approve by Lionel, seconded by Clune; passed with unanimous consent

1.5   Review of Action Items
There were no action items

1.6   Approval of the Draft Agenda
Reference:
https://standards.incits.org/apps/org/workgroup/pl22.3/download.php/104934/PL22.3-2019-00105-Draft%20Agenda%20Feb%202019-m218.docx
Motion to approve by Steidel, seconded Snyder, and passed with unanimous consent

1.7 Review of Ad Hocs

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2. Agenda

1. Monday, February 11 2019 8:00 am

1.1 Opening business   D. Nagle

Remarks from the chair   D. Nagle
Dan noted there was a lack of clarity in procedure. We need to leave a better record when a subgroup wishes to kill a feature; write a paper and bring to plenary for final dispensation.

The task for this meeting is to work on the US wish list, and try to get as much done as possible for the Tokyo meeting

Second priority is interpretations.

Adoption of agenda   D. Nagle
Motion made by Steidel/seconded Snyder to adopt the agenda, and unanimous consent (UC)

Approval of Meeting m217 minutes D. Nagle
  Motion made by Lionel/seconded Clune to approve the m217 minutes - UC

INCITS report (if any) D. Nagle
  Dan's 3-year term as chairman of PL22.3 is up; does anyone else want to do this?

IEEE/754 report (if any) R. Corbett
  IEEE committee failed to complete standard by 2018. Going to take another year. LIkely to have some features that are less specified in the 2019 version. Problems with 2018 ballot were with new features late in process. (New features related to bit-for-bit reproduceability) IEEE has the rule that only one exception allowed per compare, the "invalid" exception.

WG23 report (if any) D. Nagle
  Dan will be working on WG23 again.

WG9 report (if any) V. Snyder
Paper 19-128 describes some issues going on with WG9.
19-118 is the notice of the Ada-Europe 24th International Conference

MPI Liaison report (if any) B. Long
  Nothing new to report

OpenMP Liaison report (if any) B. Long
The 5.0 specification was released at SC last November. A book of the specification is being sold on Amazon, if people want a hard copy:

https://www.amazon.com/dp/1795759887

The OpenMP language committee held a F2F meeting last week, hosted by NVIDIA at its Santa Clara office. A TR release is scheduled for SC'19, and 5.1 is scheduled for SC'20. 5.1 is a minor release, and we don't plan on adding any major features, or at least any major features that would require a significant amount of implementation work. The next major release, 6.0, is expected to be release at SC'22.

Here are some of the topics that were discussed in the various subcommittees, along with the projected release version it will be introduced in:

-- Miscellaneous Topics

[5.1] loop construct refinements (proposed by NVIDIA): the OMP LOOP
    construct was added in 5.0, and it allows loops to be executed
    in parallel using a team, parallel, or SIMD-level
    parallelism. The committee wants to add clauses to the loop
    construct to give more control to the user on how the loops is
    parallelized using the construct.

[5.1] SIMD extensions (proposed by Intel): allow use of function

pointers in SIMD regions; new SIMD clauses for compress, expand, conflict, and "allow early exit" support

[6.0] Loop transformation clauses (proposed by Argonne National Lab): a set of clauses that can be applied to a loop nest to specify a variety of desired loop transformations (e.g. interchange, stripmining, loop fusion, loop peeling, unrolling, loop reversal, etc.).

[6.0] General Induction Support (proposed by Intel)

-- Affinity Topics

[5.1] Affinity control for teams construct

[5.1] Expressing affinity between tasks and devices

-- Accelerator topics

A large number of topics, as usual, were discussed within the accelerator subcommittee:

[5.1] add Fortran versions of device memory routines (omp_target_alloc, omp_target_free, omp_target_associate_ptr, omp_target_disassociate_ptr, omp_target_memcpy, omp_target_memcpy_rect, omp_target_is_present).

[5.1] device-specific environment variables

[5.1] improved pointer initialization in target regions

[5.1] add is_present clause or map-type for device constructs

[5.1] allow use of function pointers within target regions

[5.1] provide asynchronous versions of the device memory routines

[5.1] add "omp promise" directive, where the users asserts certain properties about a given OpenMP region that would enable more efficient implementation of the region.

[5.1] support callls to contain functions (for Fortran) in target regions

[5.1/6.0] expose underlying streams for asynchronous execution/data transfer (e.g. CUDA streams)

[5.1/6.0] enhance deep copy support with serialize/deserialize

functions

[6.0+] operating on classes with virtual methods in target regions

-- Tasking topics

[5.1] add task-data affinity control and dependences for taskloop
construct

[5.1] add schedule clause to taskloop

[6.0+] Support repeatable task graphs

[6.0+] Support real time applications.

[6.0+] task width (reserves N number of threads for execution of a
given task)

[6.0+] Allow threads that don't bind to a parallel region to be
available for task execution ("unshackled" threads)

-- Fortran topics

[5.1] Define restrictions for coarray usage with OpenMP -- coindexed
list items not allowed in clauses, privatized coarrays
effectively lose "coarray" property, image control statements
may only appear in sequential part of program, and coindexed
references must be serialized within a given image and cannot
occur on target devices.

[5.1/6.0] Improve support for usage of array syntax in target regions
to take advantage of parallel teams and parallel threads.

[5.1/6.0] Allowing loop or workshare constructs to be applied to DO
CONCURRENT loops

-- C/C++

[5.1] Adopt attribute syntax as substitute for various declarative
directives

[5.1] Define behavior for use of noreturn, move operations, and
alignment

[5.1] Define behavior for use of base language atomic and fence
operations

UPC/PGAS Liaison report (if any)   B. Friesen

Quiet, little new code is being written.
More focus on GASNet.

OpenACC Liaison report (if any) G. Klimowicz

Information about OpenACC, including the current standard document,
training materials, and upcoming events can be found at
http://www.openacc.org/.

The current OpenACC 2.6 standard includes support for manual deep copy of
data structures to target processors.

There are over 110 applications in production or development using
OpenACC, including:
  - Gaussian 16
  - ANSYS Fluent
  - VASP
  - MPAS-A
  - COSMO
  - GAMERA for GPU
  - Quantum Espresso

There are more "hackathons" coming up in 2019, where researchers bring their
codes to work alongside with OpenACC experts to accelerate their
applications.
Event dates are posted at https://www.openacc.org/events.

OpenACC has ratified version 2.7:
1. Make it clear that the host can be a device.
2. Listing which fortran intrinsics and math.h functions should be supported.
3. Fortran bindings for API routines.
4. Treat reduction as a data clause (for parallel loop reduction).
5. Clarify that the host data construct used without "use device"
   means nothing
6. Array reductions
7. "acc parallel self" - run this in parallel on the current device

Version 2.7 of the OpenACC specification can be found at
https://www.openacc.org/specification.

We also understand that at the OpenMP face-to-face meeting last fall that the
OpenMP group is planning to create a roadmap for how OpenACC constructs
are mapped to OpenMP constructs. This would effectively mean that "#pragma
acc" would be treated as a new way to spell "#pragma omp" and dramatically
reduce the porting problem for codes that used both.

Flang open source report (if any) G. Klimowicz
Flang is an open source compiler for Fortran, sponsored by the US

Department of Energy (particularly, LLNL, Sandia and LANL).

The goals of the project are to
   - Create a new, open source Fortran 2018 compiler with
     Apache 2.0 licensing,
   - that can be used for language and parallelization
     experimentation,
   - that exists as a peer in the LLVM community of languages,
     like Clang,
   - that can rely on LLVM code generation and parallelism support for CPUs
and GPUs.

There are flang-dev and flang-announce mailing lists you can join
for discussion of Flang at http://lists.flang-compiler.org/ and a
Slack channel, http://flang-compiler.slack.com/ for more

There is a biweekly half-hour conference call providing status updates on
Flang, every other Wednesday at 8:30 AM Pacific time (the next is February 20,
2018). If you are interested in participating in these calls, please let Gary
Klimowicz (gklimowicz@nvidia.com) know and he will forward the meeting
invitation.

Current Flang Compiler

The initial version of Flang is derived from the PGI Fortran compiler, with some
proprietary features removed (OpenACC support, inter-procedure analysis). It
was published on GitHub in May 2017 at github.com/flang-compiler, and
consists of several subprojects (including the Flang driver and compiler itself,
and changes to LLVM to support Fortran debug metadata to be upstreamed).
The current compiler supports Fortran 2003 and some Fortran 2008 features.

Recent improvements to Flang include
   - many bug fixes and enhancements from the PGI compiler;
   - many improvements in the libpgmath library;
   - initial support for OpenMP target offload based on
     Clang's LLVM 7.0 work.

Flang is available for Linux on x86-64, OpenPOWER and Arm processors, and is
the basis of the Arm commercial Fortran compiler. AMD has indicated their
interest in adopting flang as well. Members of the community are also working
on ports to Mac OS X and packages for OpenBSD and FreeBSD.

Contributions to this version of the compiler are encouraged, but require
executing a contributor license agreement (CLA) with NVIDIA due to the nature
of the way we combine internal and external improvements to Flang.

Interactive communication with the Flang community.

The New F18 Compiler

The older code base used to seed the initial Flang compiler is not going to meet the long-term goals of the project. NVIDIA has begun a new project to rewrite the Fortran front-end in C++ to better align with the LLVM and Clang communities and to better leverage the existing tools and techniques from these communities.

This new front-end, which we call F18, is available at https://github.com/flang-compiler/f18. All development for F18 is being done on the open source repository, and you can follow the pull request activity from our developers there.

No contributor license agreement is needed to contribute to F18, which is being developed under the Apache 2.0 license with LLVM extensions (the same as LLVM and Clang).

The current state of F18 is
  - written in modern C++ following LLVM conventions;
  - parses all of Fortran 2018 to abstract syntax trees (AST);
  - implements preprocessing directives;
  - recognizes most common comment-based directives
    (including OpenMP), though there is limited semantic
    processing;
  - implements semantic analysis for types and symbols, including
    derived types, modules and submodules, constants and constant
    expressions;
  - has initial "Fortran Intermediate Representation" tree
    definition for defining a control flow graph above that provided
    by LLVM IR.

We are at a point where people interested in Fortran tooling (formatters, preprocessors, source-to-source compilers) can use the F18 parser. We are encouraging people to do so and to provide feedback and enhancements to F18.

Upcoming work includes
  - continued work on statement and expression semantics, lowering
    from AST to FIR trees;
  - definition of runtime environment;
  - implementation of Fortran I/O semantics and runtime.

We plan to be able to compile single-threaded Fortran 2018 programs this year.

Beginning Treasurer's report   J. Steidel
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    11 Feb 2019 Opening balance                    $  3382.36
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Beginning membership report

     12 member organizations, one more pending, 11 represented here.
     Total Membership at beginning of Meeting 217   : 12 (plus one pending)
     Majority [1 over half]   : 7
     Quorum [1/3 of voting members, min 4 present]   : 4

Attendance is recorded above.

Local arrangements   C. Rasmussen
  Craig is taking requests for snacks. Marriott will provide soft drinks and water.

Comments from members
On meeting schedules; particularly the February meeting.
Can we move the February meeting to first or third week of Feb?
Meeting will move to the week of last Monday in Feb.

1.2 Tutorials (if needed)

1.3 Subgroup organization   D. Nagle

/JoR: Dan Nagle (head), Steve Lionel, Lorri Menard, Gary Klimowicz
  Papers assigned:
  19-107,19-108,19-110r1,19-111,19-113,19-120,19-121,
  19-122,19-123,19-133

/Data: Malcolm Cohen (head), Tom Clune, Ondrej Certik, Reuben Budiardja, Van Snyder,
  Bob Corbett, Damien Rouson, Craig Rasmussen, Vipul Parekh .
  Papers assigned:
  19-112, 19-125, 19-126, 19-127

/HPC: Bill Long (head), Srinath Vadlamani, Jon Steidel, Brian Friesen, and Daniel Chen.
  Papers assigned:
  19-109,19-132

/INTERP: Malcolm Cohen (head)
  Papers assigned:
  19-114, 19-119, 19-124, 19-129, 19-130, 19-131

/EDIT: Malcolm Cohen (head)
  Papers assigned:
  19-115, 19-116, 19-117

  Recessed to subgroup meetings at 9:08

1.4 Subgroup meetings

1.5 Subgroup reports (4:30 pm)

/JoR

For vote tomorrow:
19-107r1, 19-108r1, 19-111r1,19-137,19-138,19-139

/Data

For vote tomorrow:
19-135 (with straw) Supercedes 18-265, 19-112
19-141 reply to 19-126,19-127

/HPC

For vote tomorrow:
19-140 (reply to 19-109)

/EDIT

Disposing of these papers:
18-267 - needs to be either an interp, or a suggestion for a future revision
(Lionel) suggestion for next
18-116 - Withdrawn

/INTERP

Discussed:
19-136 - rejected, no action because the results ARE as-if it had been done in array-element order.
(Will do a 136r1)

Recessed for the day at 5:00 PM

2. Tuesday February 12,2019 8:00 am

2.1 F202x Plenary (19-010)   Subgroup Heads

/JoR:
** Motion 19-107r1 "Irregularities (index variables)" [Snyder/Lionel]
(Nagle/Lionel) UC

** Motion 19-108r1 "Medium-grain parallelism" [Snyder/Nagle]
(Nagle/Lionel) Vote: 11 (For) - 1(Against)

** Motion 19-111r1 "Instead of += etc" [Snyder/Klimowicz]
(Nagle/Clune) UC

** Motion 19-137 "Specifications and Edits of AT" - Spec and Syntax only
[Nagle] (Nagle/Klimowicz) UC (to repeat, on spec/syntax only)

** Motion 19-138 "Specification and Edits for longer statements" [Nagle]
(Nagle/Snyder) through discussion some questions were answered:
"10,000" is in decimal.
One million is enough.
Continuation line limit is removed.
Straw Vote (SV) to require that overline-limit be diagnosed:

13 - 0 - 3 (y/n/u)
  To be amended and returned.

** Motion 19-139 "Specifications and Edits for log<n> & friends" [Nagle]
   (Nagle/Clune) UC

/Data:
** Motion 19-135 "Protected types and components" [Cohen]
  (Cohen/Snyder) Straw vote was conducted to determine if should
  focus on protected types or protected components:
    SV: Types - Components - Neither – Undecided
       0 - 9   - 3 - 6
  As amended to focus on components UC

** Motion 19-141 "Abstract procedures not proceeding" [Snyder]
   (Cohen/Clune) UC

/HPC
** Motion 19-140 "Reply for paper 19-109" [Long] (Long/Steidel) UC

/Edit
  No business today

/Interp
  No business today

2.2 Tutorials (if needed)

  Ondrej gave a tutorial on Demo of LFortran, an interactive LLVM-based Fortran compiler.
(https://nbviewer.jupyter.org/gist/certik/f1d28a486510810d824869ab0c491b1c)
LFortran can execute user's code interactively in the Jupyter notebook to allow exploratory work (much
like Python, MATLAB or Julia). The demo showed simple statements and control flow as well as
interactive plotting.

Recessed to subgroup meetings at 9:15

2.3 Subgroup meetings
2.4 Subgroup reports (4:30 pm)
/JoR:
     For vote and/or discussion tomorrow:
   19-110r2, 19-122, 19-133r1, 19-137r1, 19-138r1, 19-139r1, 19-145

/Data:
     For vote tomorrow: 19-142

/HPC:

For vote tomorrow: 19-146 (reply 132)

/Interp:

For vote tomorrow:
19-114r1, 19-119r1, 19-124, 19-129, 19-130, 19-131, 19-136r1

Recessed at 5:00.

3. Wednesday, February 13, 2019 8:00 am

3.1 F202x Plenary (19-010)   Subgroup Heads

/JoR:
** Motion 19-110r2 "Supporting rank genericity -- NOT VECTOR SUBSCRIPTS!"
  [Snyder/Menard] (Nagle/Lionel) 8 - 1 - rest out of the room

** Motion 19-122r1 "Supporting generic programming -- updaters"
  [Snyder/Klimowicz] (Nagle/Long) 9 - 1 - rest out of the room

  19-133r1 "Use cases for exception handling"   [Clune/Nagle/Lionel/Klimowicz]
(For discussion, no vote)

** Motion 19-137r1 "Specifications and Edits of AT" [Nagle]
  (Nagle/Menard) As amended UC

** Motion 19-138r1 "Specification and Edits for longer statements" [Nagle]
  Specification only: (Nagle/Menard)

  SV: Hard limit - processor dependent - no opinion
     7   6   4

  Now a vote: 11 – 1   Specification passed.
  Vote the edits: 11 – 1 Edits passed.

** Motion 19-139r1 "Specifications and Edits for log<n> & friends" [Nagle]
  Specs: (Nagle/Cohen) UC
  Edits: (Nagle/Lionel) UC

-- Motion 19-145 "Degree trigonometric functions" [Menard] (Nagle/Clune)
  Withdrawn for rework

/Data:
** Motion 19-142 "TYPEOF and CLASSOF" [Cohen](Cohen/Snyder)
  As amended UC

/HPC:
  ** Motion 19-146 "Response to 19-132" [Steidel] (Long/Steidel)
    As amended UC

/Edit:
** Motion 18-267 "Syntax errors in example codes" [Friesen]
  (Cohen/Long) UC
** Motion 19-115 "Making note of Statement Entities" [Lionel]
  (Cohen/Steidel) UC
** Motion 19-117 "Coarrays of type TEAM_TYPE" [Steidel](Cohen/Steidel) UC
** Motion 19-143 "remaining block data subprogram" [Corbett]
  (Cohen/Klimowicz) UC
** Motion 19-144 "procedure pointer components" [Corbett]
  (Cohen/Corbett) UC

/Interp:

  ** Motion 19-114r1 "Problems with C_FUNLOC and C_F_PROCPOINTER being PURE"
    [Long/Steidel] (Long/Steidel) As amended UC
** Motion 19-119r1 "Contradiction with assumed rank" [Snyder/Cohen]
  (Cohen/Snyder) UC
** Motion 19-124 "Bad examples?" [Steidel] (Cohen/Steidel) UC
** Motion 19-129 "Program completion" [Cohen] (Cohen/Clune) As amended UC
** Motion 19-130 "Connection of INPUT_UNIT and *" [Cohen]
  (Cohen/Long) As amended UC
** Motion 19-131 "Connection of INPUT_UNIT" [Cohen]
  (Cohen/Steidel) As amended UC
** Motion 19-136r1 "F2018 interp: In array element order execution should apply to IMPURE elemental
function only" [Chen/Cohen]
(Cohen/Klimowicz) UC

Recessed to subgroup 12:00

3.2 Tutorials (if needed)

3.3 Subgroup meetings

3.4 Subgroup reports (4:30 pm)
  /JoR:

      For vote tomorrow: 19-133r2, 19-147r1, 19-149

/Data:

      For vote tomorrow: 19-152, 19-150

/HPC

      No papers.

/Edit

No papers.

/Interp

For vote tomorrow: 19-151

Recessed until tomorrow at 5:00

4. Thursday, February 14, 2019 8:00 am

4.1 F202x Plenary (19-010)   Subgroup Heads

/JoR
** Motion 19-133r2 "Use cases for exception handling"
   [Clune/Nagle/Lionel/Klimowicz]
   Discussion SV: Continue with investigation - drop – undecided
          16 - 0 - 1

** Motion 19-147r1 "SELECTED_LOGICAL_KIND" [Snyder/Nagle]
   (Nagle/Snyder) UC
** Motion 19-149 "Require reports of ignorance" [Nagle] (Nagle/Lionel)
   As amended UC

/Data

** Motion 19-150 "Rank-agnostic array element and section denotation"
   [Cohen] (Cohen/Snyder) UC
** Motion 19-152 "BOUNDS and RANK attributes" [Clune] (Cohen/Clune)
   As amended UC

/HPC
   No papers

/Edit
   No papers

/Interp

** Motion 19-151 "Categories of pure procedures" [Corbett]   (Cohen/Rouson) UC

Recessed to subgroup at 10:30

4.2 Tutorials (if needed)
4.3 Subgroup meetings
4.4 US TAG (4:15 pm)   D. Nagle
No TAG required this meeting.

4.5 Subgroup reports (4:30 pm)

/JoR
  For vote tomorrow: 19-145r1, 19-156, 19-157, 19-158, 19-160

/DATA
   For vote tomorrow: 19-155 - voting on the use cases.

/HPC
    For information only: 19-159

/Edit
    For vote tomorrow: 19-162

/Interp
   For vote tomorrow: 19-153

Recessed for the evening at 4:43PM.

5. Friday, October 19, 2018 8:00 am

5.1 F202x Plenary (19-010)   Subgroup Heads

/JoR
   ** Motion 19-145r1 "Degree trigonometric functions" [Menard]
  (Nagle/Klimowicz) As amended to fix COS and to remove COMPLEX. UC
** Motion 19-156 "Control of leading zero in formatted numeric output"
  [Lionel] (Nagle/Lionel)
  Straw vote on keywords:
     Present - Print - Provide - Produce   Don't care
        0   6   0   5   2
  as amended: UC
** Motion 19-157 IEEE Circular trigonometric functions [Menard]
  (Nagle/Menard) As amended to repair intervals and complex. UC

-- Motion 19-158 "Add reductions to DO CONCURRENT" [Klimowicz]
  (Nagle/Klimowicz)
  Straw Vote: Continue with this? Y - N - U   11 - 0 – 1
  Straw Vote 2: Intrinsic operations on intrinsic types
   Withdrawn for more work.
** Motion 19-160 "Part 2 Procedures"[Nagle] (Nagle/Lionel) UC

/DATA

19-154 "Macro processing facility" [Cohen] For information only.

19-161 "Protected components" [Snyder/Cohen] For information only.

!! Motion 19-155 "Restricting generic parameters" [Clune]
(Lionel/Klimowicz)   Paper failed, 1 yes 7 no

/HPC

19-159 "BITS" For information only

/Edit

** Motion 19-162 "C_PTRDIFF_T" [Lionel] (Lionel/Chen) UC

/Interp

** Motion 19-153 "Categories of elemental procedures" [Corbett]
(Corbett/Chen) As amended UC

5.2 Closing business

5.3 Review of action items (if any)

None.

5.4 Future meetings   D. Nagle

2019 Meeting dates:

m219 Aug 5-9. 2019
Tokyo, Japan
Joint with WG5.

m220 Oct 14-18 2019
Las Vegas NV USA
Host: Van Snyder

2020 Meeting dates:

m221 Feb 24-28 2020
Las Vegas NV USA
Host: Jon Steidel

5.5 Treasurer's report   J. Steidel

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11 Feb 2019 Opening balance                $  3382.36
11 Feb 2019 Meeting fees waived             +   0.00
                                           -------
           Subtotal                        $  3382.36
14 Feb 2019 Snacks for mtg 218              -  95.04
                                           -------
           Subtotal                        $  3287.32
15 Feb 2019 Refreshments Residence Inn      - 243.75
                                           -------
15 Feb 2019 Closing balance                $  3043.57
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5.6 Closing membership report   L. Menard

Because Reuben Budiardja attended this meeting, Oak Ridge has now completed its observation meeting, and will obtain voting membership next meeting.

Los Alamos might be able to piggy-back on its C++ membership; Ondrej to investigate.

ARM has applied for PL22.3 membership, but the paperwork has not yet gone through.

5.7 Comments from members

This [19-155] was the first paper that was voted against in recent history.

Adjournment   11:30

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3.   Other Business

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4.   Future Meetings

2019 Meeting dates:

m219 Aug 5-9. 2019
Tokyo, Japan
Joint with WG5.

m220 Oct 14-18 2019
Las Vegas NV USA
Host: Van Snyder

2020 Meeting dates:

m221 Feb 24-28 2020
Las Vegas NV USA
Host: Jon Steidel

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5.   Adjournment

Meeting adjourned 11:30 AM