

**ISO/IEC JTC 1/SC 22
Programming Languages**

Document Type: Summary of Voting/Table of Replies

Document Title: Summary of Voting on SC 22 N 4319, CD Ballot for ISO/IEC 1539-1, Programming languages – Fortran – Part 1: Base language

Document Source: SC 22 Secretary

Document Status: As per the results of this ballot, the CD is registered. WG 5 is instructed to review the comments received and provide a response. The summary of voting on the CD registration is contained in N 4404.

Action ID: ACT

Due Date:

No. of Pages: 40

Result of voting

Ballot Information:

Ballot reference:	SC22 N 4319
Ballot type:	CD/FCD
Ballot title:	ISO/IEC 1539-1, Information technology - Programming languages - Fortran - Part 1: Base language
Opening date:	2008-03-20
Closing date:	2008-08-31
Note:	This document is circulated to SC 22 members ballot. Please submit your vote by the due date indicated. Please note that the due date for this ballot has been chosen by WG 5, and is longer than the normal three month CD ballot period.

Member responses:

Votes cast (15)	Canada (SCC) China (SAC) Denmark (DS) France (AFNOR) Germany (DIN) Italy (UNI) Japan (JISC) Korea, Republic of (KATS) Netherlands (NEN) Romania (ASRO) Spain (AENOR) Switzerland (SNV) Ukraine (DSSU) United Kingdom (BSI) USA (ANSI)
Comments submitted (0)	
Votes not cast (3)	Austria (ON) Kazakhstan (KAZMEMST) Russian Federation (GOST R)

Questions:

Q.1	"Do you agree with approval of the CD/FCD Text?"
Q.2	"If you approve the CD/FCD Text with comments, would you please indicate which type ? (General, Technical or Editorial)"

Q.3	"If you Disapprove the Draft, would you please indicate if you accept to change your vote to Approval if the reasons and appropriate changes will be accepted?"
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Answers to Q.1: "Do you agree with approval of the CD/FCD Text?"		
8 x	Approval as presented	China (SAC) Denmark (DS) Italy (UNI) Korea, Republic of (KATS) Netherlands (NEN) Romania (ASRO) Switzerland (SNV) Ukraine (DSSU)
3 x	Abstention	France (AFNOR) Japan (JISC) Spain (AENOR)
3 x	Approval with comments	Canada (SCC) Germany (DIN) USA (ANSI)
1 x	Disapproval of the draft	United Kingdom (BSI)

Answers to Q.2: "If you approve the CD/FCD Text with comments, would you please indicate which type ? (General, Technical or Editorial)"		
11 x	Ignore	China (SAC) Denmark (DS) France (AFNOR) Italy (UNI) Japan (JISC) Korea, Republic of (KATS) Netherlands (NEN) Romania (ASRO) Spain (AENOR) Switzerland (SNV) Ukraine (DSSU)
2 x	All	Germany (DIN) USA (ANSI)
2 x	General	Canada (SCC) United Kingdom (BSI)
0 x	Editorial	
0 x	Technical	

Answers to Q.3: "If you Disapprove the Draft, would you please indicate if you accept to change your vote to Approval if the reasons and appropriate changes will be accepted?"		
14 x	Ignore	Canada (SCC)

		China (SAC) Denmark (DS) France (AFNOR) Germany (DIN) Italy (UNI) Japan (JISC) Korea, Republic of (KATS) Netherlands (NEN) Romania (ASRO) Spain (AENOR) Switzerland (SNV) Ukraine (DSSU) USA (ANSI)
1 x	Yes	United Kingdom (BSI)
0 x	No	

Comments from Voters		
Member:	Comment:	Date:
Canada (SCC)	<i>Comment File</i>	2008-08-21 12:55:56
CommentFiles/Canada(SCC).doc		
Germany (DIN)	<i>Comment File</i>	2008-08-25 13:29:05
CommentFiles/Germany(DIN).doc		
United Kingdom (BSI)	<i>Comment File</i>	2008-08-26 17:24:20
CommentFiles/UnitedKingdom(BSI).doc		
USA (ANSI)	<i>Comment File</i>	2008-08-21 20:24:37
CommentFiles/USA(ANSI).zip		

Comments from Commenters		
Member:	Comment:	Date:

Template for comments and secretariat observations

Date:2008-09-15

Document: ISO_IEC_CD_1539-1

1	2	(3)	4	5	(6)	(7)
MB ¹	Clause No./ Subclause No./ Annex (e.g. 3.1)	Paragraph/ Figure/ Table/ Note (e.g. Table 1)	Type of comm ent ²	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
				<p>Canada agrees with the general changes for the revised document with some reservation. The reservations center around coarrays.</p> <p>1.) issues with coindexed objects</p> <p>A serious problem is the draft allows coindexed object in reference of procedure component and type-bound procedures. This, on its appearance, looks like a "remote function call" while it really means is a local function call. We believe that the syntax is deceptive and problematic to implement. One of our members has submitted a paper (See J3 paper 08-143r3 for further details http://j3-fortran.org/doc/year/08/08-143r3.txt).</p> <p>A similar issue also exists when a coindexed object is either polymorphic or is a derived type with components being polymorphic allocatable or a derived type with length type parameters. The problem arises for these cases when determining the appropriate type bound procedures for the references of the coindexed objects. See J3 paper 08-267 (http://j3-fortran.org/doc/year/08/08-267.txt)</p> <p>There is a technical issue on coindexed object being finalized. There is no clear semantic meaning for finalizing a coindexed object. Therefore we propose to prohibit finalizations on coindexed objects. Please see J3 paper 08-199</p>		

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				<p>http://j3-fortran.org/doc/year/08/08-199.txt).</p> <p>2.) issues with allocatable coarrays</p> <p>INTENT(OUT) allocatable dummy coarray: for an allocatable dummy argument with INTENT(OUT) attribute, the compiler implicitly deallocates its memory. If the same requirements apply to allocatable coarray dummy, then it implies synchronization on the entry to the procedure across all images -- an inadvertent event that is usually harmful to programmers. Therefore we propose for its removal. Please see J3 paper 08-158 (http://j3-fortran.org/doc/year/08/08-158.txt).</p> <p>Allocatable non-coarray dummy argument with coarray actual argument: This is simply a technical oversight for the requirement for the same corank between dummy argument and actual argument. If an allocatable coarray actual argument were allowed to be associated with an allocatable non-coarray dummy argument, then the procedure may be free to deallocate this actual argument, which implies again synchronization across all images. This situation should be prohibited. See J3 paper 08-162 (http://j3-fortran.org/doc/year/08/08-162.txt).</p> <p>3.) lack of locking mechanism for coarrays</p> <p>We also note that a limitation of the current coarray feature is lack of a locking mechanism. A lock provides fine-grained</p>		

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				<p>disjoint access to a data structure, thus allowing programmers to avoid race conditions. This is a much needed feature in the standard. We support a simple lock mechanism (no nested lock) to be introduced in the standard.</p> <p>We're aware of some recent proposals to add locks to the draft: J3 paper 08-256r2 (http://j3-fortran.org/doc/year/08/08-256r2.txt). We agree with the general direction taken by the paper. But there are technical issues need to be further discussed.</p>		
UK	General		GE	<p>Extent of revision. The current standard has not been fully implemented four years after publication and five years after technical stabilization. The language has proved to be bigger and more complicated than anticipated. Some features of Fortran 2003, for example parameterized derived types and input/output for user-defined derived types, have been found to be difficult to implement and/or to use. The proposed revision does not address these problems but instead adds considerable further complication to the language.</p> <p>It is not merely disappointing but is becoming a matter of serious concern that no full implementations are available after this period of time. Until it has proved its viability, by having several full implementations and significant vendor and user experience which can influence a revision, no new version that adds significant extra complexity should be published.</p> <p>The revision should also be seeking to consider the causes</p>		

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				<p>of the problems with Fortran 2003, and to address any that are wholly or partially caused by the standard. The approach of SC22/WG4, which is proposing that features in the 2002 Cobol standard that have proved difficult to implement be reclassified from mandatory to optional, should be considered in order to reduce the implementation difficulties of Fortran 2003.</p> <p>There is in any case concern over the volume of extensions contained in this revision. What was expected, and what was clearly needed, was a minor tidying-up revision, in the manner of Fortran 95 relative to Fortran 90.</p>		
UK	General		GE	<p>MPI. MPI is widely used by Fortran programmers for parallel programming. Features should be added to Fortran to facilitate its use.</p>		
UK	General		GE	<p>Coarrays - technical aspects. While it includes volatile coarrays, the coarray model fits well with some vendors' hardware but it would be difficult to implement on distributed memory systems and may be impractical on commodity clusters. Furthermore, volatile coarrays provide scope for unsafe programming. They should be therefore be removed from any development of the proposals.</p> <p>A full justification for these comments will be submitted directly to SC22/WG5.</p>		
UK	General		GE	<p>Coarrays - disposition. Coarrays are a large feature with ramifications throughout the language.</p> <p>The comments of rest of this section do not reflect all opinion in the UK, but do reflect that of a majority.</p> <p>The current coarray model is not sufficiently general for standardization and it is not clear that it is the best model for Fortran to adopt for the longer term. Since it is difficult to detect violation of synchronisation requirements, programs using coarrays are liable to be unreliable and difficult to debug; they may work correctly or not apparently randomly.</p> <p>Coarrays are not yet sufficiently mature to be standardized.</p>		

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				Moreover it is not clear that the Fortran programmer who has need of parallel computation facilities would prefer coarrays to more established alternative systems such as MPI. These points lead to the conclusion that coarrays should be not be in the base language but should be developed separately as an optional feature, either as a Technical Report or as an optional part of the standard.		
UK	General		GE	Description of Coarrays. The normative text pertaining to the memory model and how an image accesses data on another image is insufficiently precise. Improvements are also needed to the normative text for SYNC MEMORY and user-defined ordering. There may also need to be constraints on the use of external interfaces (including I/O and companion processors), to avoid deadlock in some standard-conforming programs executed by some conforming processors.	A paper with full details will be submitted to SC22/WG5.	
UK	10.7.5		TE	Generalized output editing. It is proposed that generalized output editing of real and complex data be extended by allowing (a) G0.d to mean output in the smallest field width but showing exactly d significant digits and (b) Gw with w non-zero to mean output in a field of w character positions with as many significant digits as can be fitted into that width. These edit descriptors are not currently defined.	A paper specifying detailed edits, principally to subclause 10.7.5, will be presented to the SC22/WG5 meeting in November 2008	
DE	13.7.22	Parag. 2 to 5	ge	- Large implementation work for compiler vendors to support intrinsic procedures which are at the same time transformational and elementary procedures - Conceptually, the dual nature of transformational/elemental is confusing - Contrary to the elemental function, which can be based on the libc / POSIX function "jn", the transformational function needs either a special support or will be only emulated multiple calls. In the latter case it is identical to BESSEL_JN([(i, i=N1,N2)], X) which is already supported by the elementatal procedure.	Delete "Case (ii)", i.e. BESSEL_JN should only be an elemental function.	

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DE	13.7.25	Parag. 2 to 5	ge	Same arguments for 13.7.25 (BESSEL_YN) as above for 13.7.22 (BESSEL_JN).	Delete "Case (ii)", i.e. BESSEL_YN should only be an elemental function.	
DE	13.7.155	Paragr. 3	te	In the 1539-1/2004 (Fortran 2003) standard for the argument "ARRAY" only arrays are allowed. By contrast the standard also allows scalars for which "Result Value" lacks a description. (Natural choice would be "1" as result value.)	Delete "a scalar or" such that the "ARRAY" dummy argument only accepts arrays.	

US National Body Comments

USNB Comments for ISO/IEC CD 1539-1

This paper contains editorial comments and technical comments in support of the USNB YES vote regarding ISO/IEC CD 1539-1. The editorial comments are immediately below. The technical comments follow the editorial comments.

Editorial Comments:

The proposed edits:

GLOBAL:

Replace "<dtio-generic-spec>" with "<defined-io-generic-spec>".

{08-161, m184}

[xiv:Introduction] last bullet item, change "non-pointer" to "nonpointer".

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{m184/EDIT}

[30:2.4.2p1] Delete "Whether an external ... processor dependent."

{08-145/EDIT, m184, The editor notes:This is already said better in 9.3.1.}

[43:3.3.1p3] Change "source forms" from bold font to normal font.

{08-145/EDIT, m184}

[65:4.5.4.1 C454+] At the end of subclause "Component definition statement"

Insert new paragraph

"The <declaration-type-spec> in the <data-component-def-stmt> specifies the type and type parameters of the components in the <component-decl-list>, except that the character length parameter may be specified or overridden for a component by the appearance of * <char-length> in its <entity-decl>. The <component-attr-spec-list> in the <data-component-def-stmt> specifies the attributes whose keywords appear for the components in the <component-decl-list>, except that the

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DIMENSION attribute may be specified or overridden for a component by the appearance of <component-array-spec> in its <component-decl>, and the CODIMENSION attribute may be specified or overridden for a component by the appearance of <coarray-spec> in its <component-decl>."

{08-180r1, m184}

[74:4.5.6.4 Note4.50] Delete second paragraph "A variable ... submodule."

{08-160/EDIT, m184}

[95:5.3.10p2-] Subclause "INTENT attribute", immediately after the last constraint before p2, add new constraint

"C541a An entity with the INTENT (OUT) attribute shall not be an allocatable coarray or have a subobject that is an allocatable coarray."

{08-158, m184}

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[95:5.3.10 Note 5.13] Append to note

"To avoid this deallocation for coarrays, INTENT (OUT) is not allowed for a dummy argument that is an allocatable coarray or has a subobject that is an allocatable coarray."

{08-158, m184}

[99: 5.3.18p1 C556] Subclause "VALUE attribute", first constraint,

Insert "that is not a coarray" at the end of the sentence.

{08-148r1, m184}

[119:6.5.2p2] After "assumed-size array" insert "(5.3.8.2)",

viz "\ref{D5:Assumed-size array}".

{08-170, m184/EDIT}

[128:6.6.3.1p5+] Before Note 6.22, insert new paragraph

"When more than one allocated object is deallocated by execution of a DEALLOCATE statement, the order of deallocation is processor dependent."

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{08-153r3, m184}

[129:6.6.3.2p12+] At end of subclause, insert new paragraph

"When more than one allocated object is deallocated by the occurrence of an event described in this subclause, the order of deallocation is processor dependent."

{08-153r3, m184}

[154:7.2.1.3p13] Change "non-coarray" to "noncoarray".

{m184/EDIT}

[171:8.1.4 C806]

Delete "or".

After "OPTIONAL" insert ", statement function, or VALUE".

{08-144r2, m184}

[187:8.5.1p2] Subclause "Image control statements", 6th bullet point,

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Delete ", END BLOCK,"

Insert another item

"\item Any statement that completes execution of a block (8.1.2.2) and results in implicit deallocation of a coarray."

{08-152r2, m184}

[188:8.5.1 Note 8.31] Change "non-volatile" to "nonvolatile".

{m184/EDIT}

[220:9.6.4.7.3p1] Subclause "Defined input/output procedures", append to p1

"The <dtio-generic-spec>s for these procedures are READ(FORMATTED), READ(UNFORMATTED), WRITE(FORMATTED), and WRITE(UNFORMATTED), for formatted input, unformatted input, formatted output, and unformatted output respectively."

{08-159r1, m184}

[225:9.6.4.7.4p1]

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Subclause "Resolving defined input/output procedure references", replace the reference "9.6.4.7" [ref{User-defined derived-type input/output}) with "9.6.4.7.3" [ref{Defined input/output procedures}].
{08-159r1, m184}

[225:9.6.4.7.4p4] Last paragraph, delete last sentence:
"This reference shall not be ... disassociated procedure pointer."
{08-159r1, m184}

[276:12.4.3.2 C1202] Delete first sentence of constraint
"The <generic-spec> shall be included ... <interface-stmt>."
{08-157r2, m184}

[277:12.4.3.2p1]
In the first sentence, replace "the procedures" with "each procedure".
Delete the second sentence "Such a specific ... procedures."
{08-157r2, m184}

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[277:12.4.3.2p7]

Reword the first sentence,

by moving "for an external procedure" from the end of the sentence to be after "explicit specific interface".

In "\obs{An interface for a procedure named by an ENTRY... body.}"

replace "named" by "defined".

{08-157r2, m184}

[292:12.5.2.6p2+] Subclause "Allocatable dummy variables",

insert new paragraph

"The corank of the actual argument shall be the same as that of the dummy argument."

{08-162r2, m184}

[292:12.5.2.8] Replace subclause title "Coarray arguments"

with "Coarray dummy variables".

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				{08-162r2, m184}		
				[292:12.5.2.8p1] Delete the second sentence "If the dummy argument is an allocatable ... same rank and corank." {08-162r2, m184}		
				[300:12.5.5.3p1,p2] Delete "interface body or" twice. {08-179r1, m184}		
				[300:12.5.5.3p2] After "dummy argument of the scoping unit" Insert "and not the name of a procedure pointer". {08-179r1, m184}		
				[300:12.5.5.3p2+] insert new paragraph "If the scoping unit contains an EXTERNAL attribute specification for the		

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name and the name is a procedure pointer, the reference is to its target."

{08-179r1, m184}

[300:12.5.5.3p3] After \obs{statement function} insert \obs{statement}.

{08-179r1, m184}

[300:12.5.5.3p4] After "intrinsic" insert "procedure".

{08-179r1, m184}

[300:12.5.5.3p5]

Before "accessible",

Insert "that is not the name of a procedure pointer".

{08-179r1, m184}

[300:12.5.5.3p5+] Insert new paragraph

"If the scoping unit contains a USE statement that makes a procedure

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pointer accessible by that name, the reference is to its target."

{08-179r1, m184}

[336:13.7.34p5] Change "AIMAG (X, KIND)" to "AIMAG (X)".

{08-184, m184}

[439:16.2p1]

Change "non-submodule program unit, common block, or external procedure"

To "common block, external procedure, or program unit that is not a

submodule"

{m184/EDIT}

[448:16.5.2.7]

In "The definition status of a pointer is that of its target."

Change "a pointer" to "an associated pointer".

Append to paragraph

"The definition status of a pointer that is not associated is

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undefined."

{m184/EDIT}

[459:A.2] Delete first bullet item "whether an external ...".

{08-145/EDIT, m184, The editor notes: see below for replacement.}

[459:A.2] After the item beginning "whether an array is contiguous",

Insert new item

"\item the order of deallocation when several objects are deallocated
by a DEALLOCATE statement (6.6.3.1) or the occurrence of an event
described in 6.6.3.2;"

{08-153r3, m184}

[460:A.2] After item "the set of allowable names for a file (9.3);"

Insert new item

"\item whether a named file on one image is the same as a file with the
same name on another image (9.3.1);"

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{08-145/EDIT, m184}

End of editorial comments

Technical Comments:

The proposed edits:

[28:2.2 R214] Add new entries to <action-stmt>, alphabetically.

"<<or>> <lock-stmt>"

"<<or>> <unlock-stmt>"

{08-168r2, m184}

[49:4.3.1.1p1 C407]

Delete the last sentence "It shall not have the VALUE attribute."

{08-147r1, m184}

[99:5.3.18p1 C556]

Replace entire constraint "An entity ... dummy data object." with

"C556 An entity with the VALUE attribute shall be a dummy data object

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that is not an assumed-size array."

{08-147r1, m184}

[99:5.3.18p1 C558]

Delete constraint "If an entity ... initialization expression."

{08-147r1, m184}

[157:7.2.2.2 C728+] Add new constraint

"C728a (R741) The <scalar-variable> shall not be a coindexed object."

{08-143r3, m184}

{The editor comments that this would be better done by modifying C728.}

[187:8.5.1p2] Add new bullet item to list after the "CRITICAL" one

"\item LOCK or UNLOCK statement;"

{08-168r2, m184}

[191:Note 8.39+] Immediately before 8.5.5 "STAT= and ERRMSG= ...",

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add a new subclause

"8.5.4a LOCK and UNLOCK statements

R862a <lock-stmt> <<is>> LOCK (<lock-variable> [, <lock-stat-list>])

R862b <lock-stat> <<is>> LOCKED=<scalar-logical-variable>

<<or>> <sync-stat>

R862c <unlock-stmt> <<is>> UNLOCK

(<lock-variable> [, <sync-stat-list>])

R862d <lock-variable> <<is>> <scalar-variable>

C851a (R862d) A <lock-variable> shall be of type LOCK_TYPE defined in the intrinsic module ISO_FORTRAN_ENV.

A <lock-variable> represents two values of a lock: locked and unlocked.

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A lock is acquired by setting its value to locked, and released by setting its value to unlocked. A lock variable is currently locked by an image if its value was set to locked by that image and has not been subsequently set to unlocked.

Successful execution of a LOCK statement without a LOCKED= specifier causes the <lock-variable> to become defined with the value locked. If the lock variable is currently locked by a different image, execution of the LOCK statement completes when the lock is released by the other image and acquired by this image.

If a <lock-variable> has the value unlocked, successful execution of a LOCK statement with a LOCKED= specifier causes the <lock-variable> to become defined with the value locked and the value of the <scalar-logical-variable> to become defined with the value true. Otherwise, the <lock-variable> is not changed and the value of the <scalar-logical-variable> becomes defined with the value false.

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Execution of an UNLOCK statement causes the value of the <lock-variable> to be set to unlocked.

An error condition occurs if the <lock-variable> in a LOCK statement is currently locked by the executing image. An error condition occurs if the <lock-variable> in an UNLOCK statement is not currently locked by the executing image. If an error condition during the execution of a LOCK or UNLOCK statement the value of <lock-variable> is not changed.

NOTE 8.39a

A lock variable is effectively defined atomically by a LOCK or UNLOCK statement. If LOCK statements on two images both attempt to acquire a lock, one will succeed and the other will either fail if a LOCKED= specifier appears, or will wait until the lock is later released if a LOCKED= specifier does not appear.

[End NOTE]

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NOTE 8.39b

During execution of a program section in which a small number of images frequently lock and unlock a single lock variable, it is possible that other images will have a difficult time acquiring the lock. This situation might result from executing LOCK statements with LOCKED=specifiers inside a spin loop.

[End NOTE]

NOTE 8.39c

The following example illustrates the use of LOCK and UNLOCK statements to manage a work queue:

```
USE, INTRINSIC :: ISO_FORTRAN_ENV
```

```
TYPE(LOCK_TYPE) :: queue_lock[*] ! Lock to manage the work queue
```

```
INTEGER :: work_queue_size[*]
```

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TYPE(Task) :: work_queue(100)[*] ! List of tasks to perform

TYPE(Task) :: job ! Current task working on

INTEGER :: me

me=THIS_IMAGE()

DO

! Process the next item in your work queue

LOCK(queue_lock) ! New segment A starts

! This segment A is ordered with respect to

! segment B executed by image me-1 below because of lock exclusion

IF(work_queue_size>0) THEN

! Fetch the next job from the queue

job=work_queue(work_queue_size)

work_queue_size=work_queue_size-1

END IF

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				UNLOCK(queue_lock) ! Segment ends ... ! Actually process the task ! Add a new task on neighbors queue: LOCK(queue_lock[me+1]) ! Starts segment B ! This segment B is ordered with respect to ! segment A executed by image me+1 above because of lock exclusion IF(work_queue_size[me+1]<SIZE(work_queue)) THEN work_queue_size[me+1]=work_queue_size[me+1]+1 work_queue(work_queue_size[me+1])[me+1]=job END IF UNLOCK(queue_lock[me+1]) ! Ends segment B END DO [End NOTE]" {08-168r2, m184}			

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[192:8.5.5p1+] Add new paragraph

"If the STAT= specifier appears, successful execution of the LOCK or UNLOCK statements causes the specified variable to become defined with the value zero. If the STAT= specifier appears in a LOCK statement and the <lock-variable> is currently locked by the executing image, the specified variable becomes defined with the value of STAT_LOCKED (\ref{}). If the STAT= specifier appears in an UNLOCK statement and the <lock-variable> has the value unlocked, the specified variable becomes defined with the value of STAT_UNLOCKED (\ref{}). If the STAT= specifier appears in an UNLOCK statement and the <lock-variable> is currently locked by a different image, the specified variable becomes defined with the value STAT_LOCKED_OTHER_IMAGE. The constants STAT_LOCKED, STAT_UNLOCKED, and STAT_LOCKED_OTHER_IMAGE are defined in the intrinsic module ISO_FORTRAN_ENV. If a STAT= specifier appears and any other error occurs during execution of a LOCK or UNLOCK statement, the specified variable becomes defined with a positive integer value that is different from STAT_LOCKED, STAT_UNLOCKED, and STAT_LOCKED_OTHER_IMAGE."

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{08-168r2, m184}

[192:8.5.5p2] Change "SYNC IMAGES, or SYNC MEMORY"
to "SYNC IMAGES, SYNC MEMORY, LOCK, or UNLOCK".

{08-168r2, m184}

[268:11.2.2p1] Replace last sentence "A submodule ... indirectly." with
"A submodule shall not access any entity from its ancestor
module by use association, directly or indirectly."

{08-154r1, m184}

[277:12.4.3.2 C1207] Replace constraint "A ... or module procedure" with
"C1207 (R1206) A <procedure-name> shall be a nonintrinsic procedure that
has an explicit interface."

{08-178, m184}

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[285:12.5.1 C1230+] Add new constraint

"C1230a (R1221) <data-ref> shall not be a coindexed object."

{08-143r3, m184}

[286:12.5.1 Note 12.16] Delete Note 12.16.

{08-143r3, m184}

[291:12.5.2.4 C1237] After "coindexed object" insert

"with the ASYNCHRONOUS or VOLATILE attribute".

{08-165r1, m184}

[291:12.5.2.4 C1238] After "nonpointer array that" insert

"has the ASYNCHRONOUS or VOLATILE attribute but".

{08-165r1, m184}

[291:12.5.2.4 C1239] After "array pointer that" insert

"has the ASYNCHRONOUS or VOLATILE attribute but".

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{08-165r1, m184}

[291:12.5.2.4 Note 12.27] After "The constraints on"

Change "actual arguments that correspond"

To "an actual argument with the ASYNCHRONOUS or VOLATILE attribute that
corresponds"

{08-165r1, m184}

[290:12.5.2.4p9] Change "is either a" to

"either the effective argument is simply contiguous or the dummy argument
is".

{08-166r1, m184}

[290:12.5.2.4p10] After "but" insert "is not simply contiguous and".

{08-166r1, m184}

[291:12.5.2.4 Note 12.27] After "Making a copy of"

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Change "actual arguments whose values are"

To "an actual argument whose value is",

And change "those new values" to "the new value".

{08-165r1, m184}

[308:12.7 C1274] After "all its nonpointer dummy data objects have"

Change "INTENT (IN)"

To "the INTENT (IN) or the VALUE attribute".

{08-181, m184}

[308:12.7 C1275]

After "dummy data objects"

Insert "that do not have the VALUE attribute".

{08-181, m184}

[308:12.7 C1280]

After "is a dummy argument of a pure function"

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Insert "that does not have the VALUE attribute".

{08-181, m184}

[320:Table 13.1] Add an entry for LOCKED_BY_THIS_IMAGE.

{08-168r2, m184}

[362:13.7.97+] Immediately before 13.7.98 "LOG (X)" add new subclause

"13.7.97a LOCKED_BY_THIS_IMAGE (LOCK_VAR)

Description. True if and only if the lock variable is currently locked
by the executing image.

Class. Elemental function.

Argument. LOCK_VAR shall be of type LOCK_TYPE defined in the intrinsic
module ISO_FORTRAN_ENV.

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Result Characteristics. Default logical.

Result value. The result has the value true of the lock specified by

LOCK_VAR is currently locked by the executing image, and

false otherwise.

Example. LOCKED_BY_THIS_IMAGE (L) has the value true if L was specified

as the lock variable in a LOCK statement executed on this image

that defined L to have the value locked, and an UNLOCK

statement has not subsequently changed the value of L to

unlocked."

{08-168r2, m184}

[397:13.8.2.13+] Immediately before 13.8.2.14 "LOGICAL_KINDS"

add new subclause

"13.8.2.13a LOCK_TYPE

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LOCK_TYPE is a derived type with private nonpointer, nonallocatable, noncoarray components. The components of LOCK_TYPE are default initialized to the values representing unlocked. Variables of type LOCK_TYPE are used as <lock-variable>s in LOCK or UNLOCK statements (ref{LOCK and UNLOCK statements})."

{08-168r2, m184}

[398:3.8.2.18+] Immediately before 13.8.2.19 "STAT_STOPPED_IMAGE", add new subclauses

"13.8.2.18a STAT_LOCKED

The value of the default integer scalar constant STAT_LOCKED is assigned to the variable specified in a STAT= specifier (8.5.5) of a LOCK statement if the lock specified by <lock-variable> is currently locked by the executing image.

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13.8.2.18b STAT_LOCKED_OTHER_IMAGE

The value of the default integer scalar constant

STAT_LOCKED_OTHER_IMAGE is assigned to the variable specified in a
STAT= specifier (8.5.5) of an UNLOCK statement if the lock specified
by <lock-variable> is currently locked by an image different from the
executing image."

{08-168r2, m184}

[398:3.8.2.19+] At the end of clause 13, add new subclause

"13.8.2.19a STAT_UNLOCKED

The value of the default integer scalar constant STAT_UNLOCKED is
assigned to the variable specified in a STAT= specifier (8.5.5) of an
UNLOCK statement if the lock specified by <lock-variable> is currently
not locked by any image."

{08-168r2, m184}

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[454:16.6.5 at the end] Add new list items

"(29) Execution of a LOCK statement containing a LOCKED= specifier causes the specified logical variable to become defined. If the logical variable becomes defined with the value true, the <lock-variable> in the LOCK statement also becomes defined.

(30) Successful execution of a LOCK statement that does not contain a LOCKED= specifier causes the <lock-variable> to become defined.

(31) Successful execution of an UNLOCK statement causes the <lock-variable> to become defined."

{08-168r2, m184}

[456:16.6.7p1 (13)] Change final "." to ";" and append new items

"(14) a <lock-variable> in a LOCK or UNLOCK statement;

(15) a LOCKED= specifier in a LOCK statement."

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{08-168r2, m184}

End of comments