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Languages
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JULY 1990

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Committee: ISO/IEC JTC1/SC22/WG11

Place: Teesside Polytechnic
Computer Centre
Middlesbrough
United Kingdom.

Date: May 30 - June 1, 1990

Attendees:		
	Mr. Edward Barkmeyer	NIST, US
	Mr. Paul Barnetson	IBM, UK
	Mr. Jean Bourgain	AFNOR, France
	Mr. Ken Edwards	IBM, US
	Mr. David Joslin	Teesside Polytechnic, UK
	Mr. Brian Meek	King's College, UK
	Mr. Willem Wakker	ACE, Netherlands
	Mr. Brian Wichmann	NPL, UK

1. Convenor

In absence of the convenor Mr. Don Nelson, the meeting was opened by Mr. Paul Barnetson as convenor of the BSI IST/5/11 panel.
After approval of the agenda, Mr. Willem Wakker was appointed to be acting convenor and chairman of the meeting.

2. Agenda (WG11 N164a)

The agenda was amended as follows:

— Corrected and changed date: "May 30 - June 1 - 1100 to 1730 Wednesday May 30, 0900 to 1730 Thursday May 31, 0900 to 1500 Friday June 1".

— Add point 6.b-bis: RPC document ECMA-127, January 1990 draft.

— Point 7.b (3): change "N1163" to "N163".

— Add point 7.5: Cross language issues.

— Add point 8.d: Any other business.

The agenda was accepted as amended.

3. Minutes of Previous Meeting (WG11 N154)

Item 3.b (2), last paragraph: strike last sentence.

Item 4.b, first paragraph: strike last sentence of this paragraph.

The minutes were approved as amended.

4. Convenor Report

As the convenor was not present at the meeting, no convenor report was presented.

The NNI is nominating Mr. Willem Wakker to become convenor of WG11.

5. National Activity Reports

5.1 BSI IST/5/11

Mr. Paul Barnetson was elected to be convenor of IST/5/11.
This panel has 13 members.

The panel has discussed the CLID WD#3, and 3 documents with comments are submitted to WG11 (WG11 numbers N170, N171 and N172).

A response is prepared on the Guidelines document (SC22/N754) stating "Yes with comments".

5.2 ANSI X3T2

The ANSI report is appended to these minutes.

5.3 AFNOR/CG 97/CN 22/GE 11

The first meeting of the French WG is on June 25, 1990. There are about 6 people expected to attend this meeting.

6. Work Item 22.14 - Language Bindings Guidelines

The ballot period on document SC22/N754 — ISO/IEC JTC1 DTR 10182 is closed. The summary of voting and the comments are not yet available.
The responses will be discussed at the next WG11 meeting.

7. Work Item 22.16 - Common Procedure Calling Mechanism

The following documents were discussed.

1. WG11 N168 - Common Language-Independent Procedure Calling Mechanism, Working Draft, Version 1.1.

   This first draft was discussed at the last X3T2 meeting. The editor plans to incorporate extensive changes that were proposed during that meeting.
   Remarks, as made for the CLID draft (see WG11 N172), regarding the ISO style of the document will also be taken into account.

   A new WD is expected before the next X3T2 meeting (July 1990).

2. WG11 N175 - Standard ECMA-127 RPC using OSI, Final Draft Second Edition, January 1990.

   The document was discussed in rather general terms. It was felt that items (a) and (b), as defined in the Scope of this document (datamodel and interface definition notation) are work items for WG11, while (c) and (d) (RPC service and protocol) are the 'real' RPC specific parts.

Milestones for the CLIPCM project:

	90-09-01	WD ready for discussion with SC21/WG6
01.04	91-02-01	WD ballot initiated within SC22
01.05	91-06-01	WD ballot within SC22 closes

8. Work Item 22.17 - Common Data Types

8.1 Language Compatible Arithmetic Standard

1. Brian Wichmann reported that LCAS had been approved as a NWI by JTC1. He said that Belgium, Japan and USSR had offered participation and therefore he had written to these national standards bodies asking for the appropriate technical persons concerned.

2. Potential modifications to LCAS were discussed as follows:

   2.1 Unbounded integers
   This had been requested by two parties concerned with logic languages. The only technical problem would be the value of maxint and minint in the case of unbounded integers. WG11 supported this extension.

   2.2 2's complement floating point
   X3T2 supports this, but it does have a visible change since the operations of 'absF' and 'negF' can then produce 'overflow'. Machines which have such floating point includes Prime and the Multics machines (Bull). It was agreed that Ed Barkmeyer would contact Bull to see if they had any views on the current wording of LCAS. If no objections were raised the status quo would be retained.

   2.3 Very unbalanced exponent ranges
   Technically, such ranges are undesirable and hence no change is envisaged unless an objection was raised with a good rationale.

   2.4 Optional operations
   If software is to be portable it cannot make use of optional operations, yet these are very convenient in some circumstances. All these operations are simple to provide and an implementation, admittedly inefficient, is available from NPL. Hence it was concluded that making these operations mandatory is highly desirable. Either users would accept the inefficiency to get the convenience, or suppliers would provide implementation efficient on their system.
   WG11 supported this conclusion.

   2.5 Language annexes
   It was noted that the examples of language 'bindings' need extensions to consider the major languages, to match the example of FORTRAN already given.

3. Next stage with LCAS
   A motion (Wichmann, Joslin) to forward N167 (changed as noted) to SC22 for registration as a DP was approved (Bourgain abstained).

   This step was thought desirable to encourage the language groups to comment on LCAS. This request is to be accompanied by a letter from the acting convenor mentioning:

   3.1 ISO language groups need to study LCAS.

   3.2 National language groups need to study LCAS.

   3.3 Two further items are being proposed for follow LCAS. The LCAS itself should have a note from the Editor noting potential changes as listed in 2.1-2.5 above.

4. LCMPS and LCCAPS
   The following motion (Meek, Barkmeyer) was passed unanimously:

   > "WG11 believes that the two proposals, for Language Compatible Complex Arithmetic and Procedure Standard, and for a Language Compatible Mathematical Procedures Standard, recently forwarded by X3T2 for registration as domestic workitems, should be considered for international participation at the earliest opportunity; and therefore, without prejudice to eventual national member body votes from participating members of WG11, directs its acting convenor to take the necessary steps to submit equivalent ISO New Work Item proposals to SC22 secretariat as soon as possible."

Milestones for the LCAS project:

01.04	90-08-01	WD ballot initiated within SC22
01.05	90-11-01	WD ballot within SC22 closes

8.2 Language-Independent Data Types

Working draft 3 was reviewed by discussing the comments from the documents listed below.

Mr. Bourgain expressed his concern regarding the level of abstraction of the WD: he thinks that the document is too abstract.

The following documents were discussed.

1. WG11 N163 - CLI Datatypes WD.3, Editor's notes.
   The issues 4 and 5 of section B (grosser classes of datatypes and constructors and the criterion for retention or elimination of less common datatypes) are considered the most critical ones. WG11 should decide how to solve these problems.

   Regarding section C, issue 2 (is InOrder necessary) it was felt that characterising operations should only be added if they are really needed to distinguish between datatypes. The list does not need to be minimal, but it does need to be sufficient.
2. WG11 N170 - Comments on N162/N163 (Brian Meek).
   This document was discussed, the necessary changes to the WD were left to the editor.
3. WG11 N172 - Comments on CLID, WD#3 (P. R. Brown).
   This documents contains numerous suggestions to get the document in line with the ISO directives. The necessary changes to the WD were left to the editor.
4. WG11 N176, N177 and N178 - Various papers by Ed Greengrass.
   The documents were discussed in general terms. Specially the treatment of pointer types in the documents was appreciated. No direct changes to the WD resulted from this discussion.
5. WG11 N179 - Comments from France on the CLID, WD#3
   This document was discussed, the necessary changes to the WD were left to the editor.

It is the intention of the editor to have WD#4 available before the next X3T2 meeting (July 1990).
A motion (Barkmeyer, Meek) to forward WD#4 to SC22 for registration as a DP was passed unanimously.

Milestones for the CLID project:

01.04	90-09-01	WD ballot initiated within SC22
01.05	90-12-01	WD ballot within SC22 closes

9. Cross language issues

Cross language issues were discussed, specially in relation to conformance testing and RPC. It was felt that further consideration on this issue was needed.

The following documents were discussed.

1. WG11 N169 - Issues list version 4 (March 1990), ISO/IEC JTC1/TSG-1 N287.
   It was agreed that the Guidelines for Language Bindings (DTR 10182) should informally be brought to the attention of TSG-1. Furthermore, TSG-1 should be asked about their opinion on bindings.

2. JTC1 N711 (Modelling of Application Program Interfaces and Procedure Calls) with the US X3T5.5 comments.
   The following observations were made:
   - WG11 hopes to be involved in a workshop as suggested in the recommendations 4.1.b.
   - Recommendation 2: WG11 strongly favours such a joint meeting since otherwise the work of WG11 could be seriously affected.
   - Recommendations 7 and 8: WG11 has a more generic procedure call mechanism (than currently proposed in the RPC document), and wants to make sure that this model is not overlooked.

10. Action list

1. Edwards.
   To contact Don Nelson about the current situation on the convenorship of WG11.
2. Barkmeyer/Edwards.
   To update ANSI meeting report (EJB) and to supply CLIPCM info (KE), and to email this to Wakker, for inclusion in the minutes.
3. Wakker.
   To find out about SC21/WG6 in the Netherlands, and to see if contacts can be useful.
4. Meek.
   To contact Don Folland about possible arrangements on information exchange between WG15 and WG11.
5. Wakker.
   To inform SC22 on the coming combined SC21/WG6 and SC22/WG11 meeting.
6. Meek/Bourgain.
   To communicate with validation experts on the possibility of testing implementations for conformance with N168.
7. Wakker.
   To send letter to the people in Canada, Germany, Austria and Denmark that are on the mailing list, to ask them to pass CLID WD#3 to their parent organisations for distribution to language committees and other interested committees for comment.
8. Meek.
   To inform the BSI TSG-1 representatives informally about WG11 observations as noted in this minutes under point 9 (cross language issues).

11. Future meetings

- Second meeting 1990.
  This will be (partially) a combined meeting with the RPC rapporteur group of SC21/WG6. Suggested dates: September 24th (Amsterdam), or in October (France, Geneva).
  To be arranged by convenor WG11 and SC22/WG6 rapporteur (David Robinson).
- First meeting 1991, combined meeting with X3T2.

  Date: January 21st - January 25th, 1991.
  Place: California
  Host: IBM

— Second meeting 1991.
Suggested date: week before SC22 meeting in September 1991.
Suggested place: Vienna. Note that the SC22 meeting is also in Vienna.

ANSI X3T2 Actions Taken on CLI Documents, January-April, 1990

1. Liaison Activities

A position was drafted calling for alignment of the ANSI and ISO work on Remote Procedure Calling with the SC22 CLI standards. U.S. position for SC21 plenary (adopted by combined TAG) was to require all three to be aligned before any of them went to dp!

Final position from SC21 TAG: "Neither the RPC work nor the CLI work should be progressed to dp, unless they are aligned. That is, the RPC work should support the full complement of (normative) CLI datatypes and the concepts of the CLI Procedure Calling Mechanisms, including the syntax of the IDN. The U.S. further believes that a joint meeting of SC21/WG6 (RPC) and SC22/WG11 (CLI) is necessary to resolve the question of how such an alignment should be achieved. Only if it is sufficiently shown that the CLI work is inappropriate, and the rationale for this decision is agreed to by both committees, should non-aligned documents be forwarded."

2. CLI Procedure Calling

October 1989 meeting

- Approved appointment of Ken Edwards as project editor
- Developed milestones for project
  - 01/90 - working draft available
  - 08/90 - coordinating liaison ballot
  - 10/90 - resolve ballot comments
  - 11/90 - register dp with SPARC
- Revision required for project SD-3

January 1990 meeting

- Version 1.0 of working draft prepared
- Suggested changes to working draft
  - Clarify section on the scope of the project
  - CLIPCM needs to develop a model for LIPC
  - Establish rules for naming
  - Not necessary to make distinction between procedures and functions
  - Consider ability to specify attributes on procedures
  - Add section on pointer parameters
  - Must include support for call-by-reference
  - Remove section on hidden parameters
  - Consider support for global data
  - Asynchronous calls should not be prohibited
  - CLIPCM needs section on environment initialization
  - Relationship of CLIPCM with exception handling
- Revised project plan was submitted by project editor for review. It was decided that X3T2 should send an inquiry to all affected X3 subcommittees to determine if they

would like to be included as coordinating liaisons on the CLIPCM project before sending the revised project plan to SPARC.

April 1990 meeting

— Version 1.1 of working draft prepared

— The relationship between the SC21 RPC work and SC22 was discussed at length during this meeting. The result of the discussion was the formation of a liaison statement from X3T2 being sent to X3T5.5.

  — "The SC22/WG11 Common Language-Independent Procedure Calling project defines the "language-based" and "language-independent" aspects of the interlanguage procedure calling service. We understand that it is not the intention of the RPC to define these, but there is a need for the two to be consistent from the point-of-view of interoperability. That is, most of the characteristics of remote procedure calls are similar at the service level to the characteristics of local procedure calls on routines written in unknown languages. From the user's and programming language's point-of-view, the two interfaces should be compatible, if not identical. It is expected that in this regard, the portability concerns of SC22 will dictate that the CLIPCM standard will be more formal and less abstract than the corresponding aspects of the RPC service definition."

3. CLI Datatypes

3.1 January, 1990

Working Draft 3 was not yet available. N151 and N157 were available, but deferred to April because Greengrass was not present.

3.2 April, 1990

N151 and N157 were (re)considered vis-a-vis WD3.

N151

— 2. is answer to Issue on Pointer. accepted.

— 3. no action. Agreed that the CLID should not define character set orderings.

— 4. accepted in principle. Greengrass and Editor to draft some wording.

— 5. Modulo, accepted (actually the N157 view). Modulo should be made a generator, not a derived Integer type.

— 6. Not accepted. A discussion of the relationship between derivors and subtyping ensued.

— 7. accepted. Exception conditions for characterising operations should be called out in the CLID. It was further decided that characterising operations are "informative" (not normative) for primitive datatypes. But a new issue is raised: Should they be normative for the generators?

N157

— 1. From previous X3T2 and WG11 decision, value-only compliance is all there is! Greengrass commented that words need to be added to explain that the representation of the type for interchange should be such as to support the characterising operations.

— 3.3 (1) accepted "generate".

— 3.3 (2) no action.

— 4. as above. put back Modulo: consider explanation in terms of equivalence classes.

— 9. not accepted. WD3 stands.

Additional comments accepted.

— "numeric" is not defined.

— "extended" should be clarified. Is it a Union of types?

— the syntax for "component-datatype" doesn't work right.

— When are two CLI datatypes equal? New should be part of the type declaration (not a generator). Its presence indicates a distinct datatype, whereas the declaration otherwise defines an alias.

— Subtyping should be a section. It should include limiting the value space of primitive types, and limiting the value space of constructed types as well.

— The relationship between parameters (of generators) and type families should be explained.

— A generator should be added for "projecting" record types onto "subrecords"; it is not a subtype.

— Among the criteria for deciding what to keep: The purpose of the Collection of CLI datatypes is to provide enough distinction to allow the distinctions important to individual languages to be supported.

— Handling of "conformant" or "adjustable" arrays is a CLIPC problem and not a CLID problem. But CLID introduces datatype descriptions which must be parametrized in a CLIPC interface.

— Many-to-1 inward mappings should be permitted.

— 1-to-Many outward mappings requires support in the CLIPC, but outward mappings should be application-specific in the general case, not language-specific.

— Complex SQRT is two-valued.

4. Language Compatible Arithmetic

4.1 January, 1990

No action. No LCAS editor or commentary was present.

4.2 April, 1990

Schaffert announced that LCAS draft 2.2 had been published in SIGPLAN.

Larmouth comment was reviewed.

— 2.. particularly 2.3 and 2.4, will be taken into account in the next draft.

— 3.1 accepted.

— 3.2 not accepted. It's not clear what other runtime values or parameters could reasonably be provided.

— 3.3 ignored.

— 3.4 ?

— 3.5 accepted in principle.

— 4.1 and 4.2 require early reference to Annex A. That is accepted.

— 4.3p1 accepted. 2's complement mantissas are not properly handled and other wording should be changed.

— 4.3p2 accepted.

— 4.3p3 The answer is YES. Integer type is required in order to support the floating operations, because some of them have integer parameters! The missing parameter (largest integer which is an exact real) is deducible from the existing parameters, but a Note should be added.

— 4.3p4 accepted.

— 4.3p5 objects to the name of the function. ignored.

— 4.3p6 last comment is accepted.

— 4.3/0 editorial, generally accepted.

— 4.3/1 rejected.
is not Z; it is the represented subset of Z.

— 4.3/2 no action.

— 4.3/3 no action. Same problem as 3.2.

— 14. This is the IEEE argument. The problem is that it cannot be supported except by specific hardware, and therefore programs which depend on (conceptual) NaNs are not portable. The hardware may provide NaN support, but it must allow portable programs to turn it off, in order to get portable behavior.

Schaffert also discussed some proposed changes.

— Annexes for recommended syntax for parameters and functions, expression evaluation and exception handling for the principal ISO standard languages, derived from existing work of the language committees where possible.

— Option or requirement for notification of underflow.

— Revision of requirements to accommodate 2's complement mantissa.

— Elimination of "optional" functions, for portability.

— Revision of exponent balancing rules to accommodate the Prime imbalance. Other members argued that this might not be a wise idea; the standard should not be stretched to accommodate a particularly ill-designed floating-point implementation, if there is a noticeably negative effect on portable programs.

5. New Work Items

5.1 January, 1990

none.

5.2 April, 1990

— LC Mathematical Procedures Standard proposal (N165) was considered, edited and approved as edited.

— LC Complex Arithmetic and Procedures Standard proposal (N166) was considered, edited, and approved as edited.

— New versions.