

Accredited Standards Committee  
X3, Information Technology \*

Doc. No: **X3/94-420 0**

Date: May 31, 1994

Project:

Ref. Doc:

Reply To:

Department of Defense  
8457 Rushing Creek Court  
Springfield, VA 22153

Mr. Rex Jaeschke  
Chair, X3J11  
DEC Professional  
2051 Swans Neck Way  
Reston, VA 22091

Dear Rex:

Committee X3H5 has requested that they be changed from an active Technical Committee to a Maintenance Technical Committee. X3H5 has unfinished Project 965-D for "Binding to ANSI/ISO 9899:1990[1992], Programming Language C, of the Parallel Processing Model for High Level Programming Languages". X3H5 has suggested that the project be changed from a standard's development project to a technical report development project and reassigned to X3J11 for completion.

OMC cannot grant the X3H5 request for maintenance status at this time; they have not completed processing of their draft standard for Parallel Processing Constructs for High Level Programming Languages. However, that processing should be completed in the near term and OMC must make some initial assessment of the disposition of Project 965-D. Therefore, OMC would like X3J11 to consider assuming responsibility for the C Language Binding Project that currently belongs to X3H5. A copy of the Project Proposal for Project 965-D is attached.

Would you have X3J11 review the Project Proposal and determine if they are interesting in pursuing this development effort. If they are interested and want to assume responsibility for it, either as a standard's development project or a technical report development project, OMC will reassign the project to X3J11, for whichever development X3J11 desires, when X3H5 becomes a Maintenance TC. If X3J11 is not interested, OMC will withdraw the project.

I apologize for the quality of the attached Project Proposal. OMC never received it in any form other than by fax, and the quality of the transmission leaves much to be desired.

OMC would appreciate a response by October 21, 1994, so that this matter can be discussed further at the OMC November meeting.

Thank you for your assistance in this regard.

Sincerely



WILLIAM C. RINEHULS  
Chairman, OMC

Attachment: Project Proposal 965-D

Title: Project Proposal -- ANSI C Binding  
 Document Number: X3H5/90-0007-D  
 Author: Bruce Leasure  
 Date: December 1991  
 Project Number: --

X3/92-0049R2-X, S

## 1. Identification of Proposed Project

Title: Binding to ANSI/ISO 9899:1990 [1992] Programming Language C  
 of  
 The Parallel Processing Model for High Level Programming Languages  
 which is currently under development by X3H5

Proposer: Bruce Leasure  
 X3H5  
 Kuck & Associates, Inc.  
 1906 Fox Drive  
 Champaign, IL 61820  
 (217) 356-2288  
 bleasure@kai.com

Date Submitted: December 5, 1991

ReSubmitted: March 4, 1992

Project Type: D

## 2. Justification of Proposed Standard

(ANSI/ISO C)

Needs: ANSI/ISO 9899:1990 [1992] Programming Language C is one of the languages that is used in parallel computing systems in the high-end scientific computer market place. Many vendors provide their own extensions to ANSI C in order to use these systems. These extensions are not uniform and users must spend significant resources to port applications from one parallel computing system to another.

The purpose of the proposed standard is to facilitate the porting of applications coded using these standards between parallel computing systems. The intent of this project is to provide not only standardization of existing practice, but new features which should meet anticipated needs in the field of parallel computing.

This proposed standard effort will bring together experts in the area of parallel computing and ANSI C to adapt the model to ANSI C. This is analogous to the standards efforts for data base or graphics.

Recommended Scope of Standard : This standard will specify the binding of the model being developed under ANSI X3 Project 737 to ANSI C. The proposed binding will employ methods from ISO/IEC FDIS 10182 "Guidelines for Language Bindings".

Existing Practice in Area of Proposed Standard : Many of the vendors represented on X3H5 have addressed the following issues in parallel computing in some manner.

- 1) Identification of loop based parallelism
- 2) Identification of non-loop based parallelism
- 3) Synchronization of computation elements
- 4) Sharing and hiding of data between computation elements
- 5) Advanced functionality for experienced users to optimize performance



**Expected Stability of Proposed Standard, with Respect to Current and Potential Technological Advance :**

Many of the vendors represented on X3H5 provide some subset or the functionality envisioned for this standard, though the details differ from vendor to vendor. A set of the fundamental issues in parallel computing have become fairly well understood. If the proposed standard addresses these issues, and takes the best solutions from the various vendors, the proposed standard should be quite stable with respect to potential technological advances.

**3. Description of Proposed Project**

**Type of Document:** standard

**Definitions of Concepts and Special Terms :**

parallel computing system - a computer system which can apply more than one processing element to a single user program, with an independent instruction stream running on each processing element.

**Expected Relationship with Approved X3 Reference Models :** No areas of conflict with X3 Reference Models for DBMS or OSI anticipated.

**Recommended Program of Work :**

- 1) Prepare a draft proposed standard for public review and comment.
- 2) Maintain liaison with other national and international groups interested in parallel computing standardization and standardization of C.
- 3) Keep users and vendors of parallel computing systems informed of the direction and activities of the committee in order to encourage feedback.

**Resources -- Individuals and Organizations Competent in Subject Matter**

X3H5 has a membership of computer vendors, representatives from software vendors, government laboratories, and large users.

**Recommended X3 Development Technical Committee :** X3H5

**Anticipated Frequency and Duration of Meetings :** 4 yearly, 3-4 days each

**Target Date for dpANS to X3 :** September 1993

**Estimated Useful Life of Standard :**

The standard will have a useful life of five years, and may need to be revised at that the end of that period. If the underlying language standard is revised, this standard should also be reviewed.

**4. Implementation Impacts**

**Impact on Existing User Practices and Investments :** Users of parallel processing systems currently incur major costs when moving applications from one vendor to another. No single vendor provides equivalent functionality to all other vendors. In some important cases, functionality works in contradictory fashion, thus requiring drastic modifications.

The cost to port an application to the proposed standard should be no greater than porting to any single other vendor. Once ported, if the application uses only features in the standard, the cost of moving to a different vendor should be drastically reduced.

Impact on vendor Products and Support :. Many of the vendors represented in X3H5 provide some of the facilities envisioned for this standard. None of them provides all of the facilities envisioned, and none of them provides the facilities in exactly the form envisioned. Thus the vendors will have to modify existing features and add features to their compilers and run-time libraries. Depending on the approach chosen by the vendor, changes may also have to be made to the assemblers, loaders, debuggers, profilers, and the operating system. Documentation will also have to be updated.

Techniques and Costs for Compliance Verification : A test suite exercising the features and capabilities of this binding should be developed. The committee will provide some examples, but not a verification or validation suite.

Legal Considerations : None known.

#### 5. Closely Related Standards Activities

Existings Standards : None.

#### X3 Standards Development Projects

- 1) X3J11.1 : The ideas under discussion do not address explicit parallel computing at the loop or block level.
- 2) X3/SPARC Study Groups : None.

#### Other Related Domestic Standards Efforts

- 1) IEEE P1003.4, P1003.10, P1003.12, P1003.14

#### ISO Standards Development Projects : None

Other Related International Standards Development Projects : None.

#### Recommendations for Coordinating Liaison :

- 1) X3J11 (Programming Language C)

#### Recommendations for Liaison :

- 1) X3J16 (Programming Language C++)