— PROJECT PROPOSAL —

Revision of C Language Standard ISO/IEC 9899:1990

1. Identification of Proposed Project

1.1 Title

Revision of C Language Standard ISO/IEC 9899:1990.

1.2 Proposer

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Mr. Jaeschke proposes this project on behalf of committee X3J11 which endorsed it at their December 1994 meeting in Plano, TX.

1.3 Date Submitted

December 20, 1994.

1.4 Project Type

RI – Revision of an ISO Standard.

2. Justification of Proposed Standard

2.1 Needs

Much is happening that can or does influence C directly. Examples are the evolution of C++ (and object-oriented programming in general), the numerical extensions being proposed by X3J11 in a Technical Report, internationalization and advancements in character set standardization, and cross-language standards and bindings. It is deemed desirable to integrate some of these things into a revision of the C Standard.

We do not view C++ as being "the logical successor to C." We endorse the principle of maintaining the largest common subset between the two languages clearly and from the outset. Such a principle should

satisfy the requirement to maximize overlap of the languages while maintaining a distinction between them and allowing them to evolve separately. We are content to let C++ be the "big" and ambitious language. While we may well embrace some features of C++, it is not our intention that C become C++.

In specifying the original standard, the Committee used several guiding principles, the most important of which were:

1. Existing code is important, existing implementations are not.

2. C code can be portable.

3. C code can be non-portable.

4. Avoid "quiet changes."

5. A standard is a treaty between implementor and programmer.

6. Keep the spirit of C.

These original principles have been re-endorsed and the following new ones added:

1. Support international programming.

2. Codify existing practice to address evident deficiencies.

3. Minimize incompatibilities with C90 (ISO/IEC 9899:1990).

4. Minimize incompatibilities with C++.

5. Maintain conceptual simplicity.

2.2 Recommended Scope of Proposed Standard

Our plan is to accept only those proposals that have some prior art. Unless some proposed new feature addresses an evident deficiency that is actually felt by more than a few C programmers, we should entertain no new inventions.

Areas to which we intend to look when revising C include (in no particular order):

1. Incorporate Amendment 1.

2. All technical corrigenda and records of response.

3. Future directions in current standard.

4. Features currently labeled obsolescent.

5. Cross-language standards groups work.

6. The evolution of C++.

7. The evolution of other languages particularly with regard to interlanguage communication issues.

8. Other papers and proposals from member delegations, such as the numerical extensions Technical Report being proposed by X3J11.

9. Other comments from the public at large.

10. Other prior art.

2.3 Existing Practice

The most substantial technical proposals likely will involve the addition of features already present in C++ or being proposed by X3J11's Technical Report on numerical extensions. Considerable prior art exists from both these areas.

2.4 Expected Stability of Proposed Standard

The main topics to be addressed are applicable to both established and "leading edge" hardware and operating systems. The issues are not peculiar to a particular hardware or software architecture. As such, the revised standard is expected to transcend hardware and software developments for the foreseeable future.

3. Description of Proposed Project

3.1 Type of Document

Standard.

3.2 Definitions of Concepts and Terms

The addition of any new terms will be coordinated with the appropriate Vocabulary Committee.

3.3 Expected Relationship with Approved X3 Models

None.

3.4 Recommended Program of Work

The revision process is expected to involve the following steps:

1. Finalize the revision charter.

2. Establish submission procedures.

3. Nominate a project editor and create a new base document by incorporating Amendment 1 and all technical corrigenda into the existing standard.

4. Evaluate the impact of related standards.

5. Evaluate and refine technical submissions.

3.5 Resources

Membership in X3J11 and attendance at its meetings is on the increase. All evidence indicates sufficient interest and ability to make this effort successful.

3.6 Recommended X3 Development Technical Committee

X3J11.

3.7 Frequency and Duration of Meetings

No more than three times per year with each meeting lasting five days. Given that the membership of X3J11 has the largest amount of technical expertise, it is proposed that meetings be co-located with SC22/WG14 (ISO C), with two out of every three being held in North America. Currently, meetings are scheduled for:

1. June 1995, Copenhagen, Denmark

2. October 1995, Nashua, NH.

3. February 1996, Orange County, CA

4. June 1996, Amsterdam, Netherlands

X3J11 has had several such co-located meetings in the past and they have worked very well. Apart from removing the duplication of administrative matters, it provides a far bigger pool of technical experts at SC22/WG14 meetings. SC22/WG14 has agreed to hold co-located meetings with us throughout the revision process.

3.8 Target Date for dpANS to X3

The milestones for the revision process are:

1. CD Registration – December 1996

2. CD Ballot – December 1997

3. DIS Ballot – December 1998

This schedule allows for the formal adoption of a revised standard by the end of 1999.
The purpose of this schedule is twofold:

1. To provide the public with a reasonably accurate idea of when a revised C Standard is likely to appear.

2. To keep the revision process focused.

3.9 Estimated Useful Life of Standard

10 years.

4. Implementation Impacts

4.1 Impact on Existing Users

Two main goals throughout the revision will be to minimize incompatibilities with C90 (ISO/IEC 9899:1990) and the emerging standard for C++. The intent is to have minimal, if any, negative impact on existing conforming C programs.

4.2 Impact on Supplier Products and Support

No negative impact is expected.

4.3 Techniques and Costs for Compliance Verification

A Standard does not require formal validation. However, various national standards bodies are aware of this proposal as are the vendors of validation suites used in those countries. Any validation requirements that may arise will likely be handled in the same manner as with the original ANSI C standard. In particular, it is *not* intended that the standards committee define, supply, or endorse a validation suite.

4.4 Legal Considerations

None known.

5. Closely Related Standards Activities

5.1 Existing Standards

The Standard is intended to be upwards compatible with C90 (ISO/IEC 9899:1990).

5.2 X3 Standards Development Projects

Committee X3J16 is currently tracking an I project to develop an ISO C++ standard (in conjunction with SC22/WG21).

    Committee X3T2 is currently tracking an I project to develop an ISO language-independent arithmetic standard (in conjunction with SC22/WG11).

5.3 X3 Study Groups

None known.

5.4 Other Related Domestic Standards Efforts

None known.

5.5 ISO/IEC JTC 1 Standards Development Projects

Committee SC22/WG21 is currently developing an ISO C++ standard.

    Committee SC22/WG11 is currently developing an ISO language-independent arithmetic standard.

5.6 Other Related International Standards Development Projects

SC22/WG20 (Internationalization).

5.7 Recommendations for Coordinating Liaison

None.

5.8 Recommendations for Close Liaison

X3J16 (C++).