

Bellcore

Bell Communications Research

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Subject: International Concerns Working Group Report

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MEMORANDUM FOR FILE

1. International Mailings

Mailings to 125+ people were conducted September 13 and October 2, 1990.

2. Tokyo Meeting

We still need a sponsor for the Tokyo, Japan meeting. We have one volunteer, but are holding out for a Japanese domiciled corporate sponsor.

3. International Participation

The People's Republic of China (PRC) and the Taiwan Software Agency have both indicated their desire and intent to participate in C++ standardization both in X3J16 and in an ISO Working Group. The PRC participation will be as observer. Taiwan's participation may be through a U.S. corporate representative. Lily Chang deserves the credit for encouraging these participants.

Potential participants in the ISO C++ Working Group are being identified to the SC22 delegations. This has already been done for Germany and will be done for other countries, specifically Canada and France. International participants in X3J16 will be identified to their respective country SC22 delegations. The idea is to help other countries take advantage of the expertise already active in X3J16 or known by X3J16 members. For example, Dag Bruck a member of X3J16, will represent Sweden in the ISO C++ working group.

4. Formal Specification

I'm fairly sure we can have one or more speakers on formal description techniques at the Nashua, NH meeting. Brian Meek, U.K. SC22 TAG delegate, offered me a very good paper on formal description techniques. Isak Korn, Danish SC22 TAG Head of Delegation, told me that he knows of someone in Denmark who may be available to do some work on or offer advise on a formal description of C++. Dmitry Lenkov gave me Derek Jones' address and phone number.¹ As I understand it, Derek is WG14 editor and wrote a formal specification for Chill in VDM. When I called Derek, he said he would have John Souter call me. John Souter, whom I understand wrote or is writing a formal specification for Modula 2, works for BSI Software Quality Assurance. To date I have not heard from John.

I have sent a letter to Cornelia Boldyreff, BSI and WG14, asking her to nominate experts on formal description techniques and special character handling. I have received no reply and will ask her again in person when I meet her at the November 26, 1990, WG14 meeting. The U.K. and

1. Derek Jones, 32 Cove Road, Farnborough, Hants GU14 OEN, U.K., Tel +44 (0252) 520667

Denmark both seem to harbor experts on formal description techniques. I sent a similar request to all of WG14 via electronic mail. I have had no responses, although I have been added to the WG14 electronic mail reflector for special character handling discussions.

5. Special Character Handling

5.1 Japanese Contacts *Tom Plum will talk on status of special character handling in WG14 and implications for C++.*

Richard Holman has conducted lengthy electronic mail discussions with the Japanese. No speaker was identified, but the most active in the area were identified. They are:

Toshi Hirasawa (HP)	toshi@hpycla
Takehisa Inose (NEC)	inose@bsd.mt.nec.co.jp
Hiromichi Kogure (AT&T)	kogure@att.co.jp
Norihiro Kumagai (Sharp)	kuma@shpcsl.sharp.co.jp
Yasushi Nakahara (Toshiba)	tsbome!ynk@u-tpkyo.ac.jp
Makoto Noda (NEC)	noda@cs2.bsd.mt.nec.co.jp

Hiromichi, Yasushi and Makoto, at least are already on the International Concerns mailing list through their POSIX involvement. Takehisa and Norihiro will be added if they haven't already through their WG14 involvement. Toshi has been added to the mailing list. All WG14 members receive International Concerns mailings.

5.2 Peter Deutsch Talk on Special Character Handling *GOAL: obtain a speaker to address wide-char equivalent libraries, such as string*

Several people were contacted leading up to Dr. Peter Deutesches' agreement to come speak to X3J16 on special character handling. Bjarne Stroustrup and Mike Miller supplied references to Dr. Harbison and Ted Goldstein at Sun. Evidently, Ted had done some work on a C++ class for Japanese character sets. Ted supplied a reference to Bill English. Bill English supplied the reference to Dr. Peter Deutsch who did the design for special character handling in Smalltalk-80. Here are some comments from Peter prefacing his talk:

Why is handling multiple / large alphabets so hard in C/C++?

- Characters are concrete, not abstract. (Programs know that characters are integers with a specific, small number of bits.)
- No agreement on an appropriate String abstraction. Most of the problem is the lack of automatic memory management.
- As a consequence, strings are generally concrete as well.
 - A large body of existing software assumes 7- or 8-bit characters.

Ow\ST, being fully object-oriented and possessing an efficient automatic memory manager, avoids these problems.

Characters in Ow\ST are 24-bit quantities. Character is a class in its own right, providing efficient, encapsulated implementations of such messages as "isDigit" or "isLetter".

Ow\ST provides multiple String encodings (typically 8-bit in the U.S. and Europe, 16-bit in Asia) with identical external protocol. This provides efficient storage, while insulating applications from knowing how the strings are stored. Strings explicitly identify what encoding they use, so an application can provide special efficient algorithms if it wishes to (e.g., comparison or pattern matching for strings with the same encoding). Strings

automatically transmute themselves to a more general encoding if needed.

OwAST also contains provisions for efficient character code conversions when displaying text, or reading or writing files.

5.3 SC22 Ad Hoc Group on Special Character Handling

Steve Carter attended the SC22 Ad Hoc Group on Special Character Handling and returned with two papers to be considered for distribution in X3J16. Of interest are, the *SHARE Europe (SEAS) White Paper on National Language Architecture*, September 1990, and *Determining When "Z" is Before "a", Sorting Algorithm Respecting Languages and Cultures*, by Alain La Bonte'.

6. Synchronization Plan

Sam Druker, X3J16 IR, prepared a draft Synchronization Plan for the ISO/IEC JTC1/SC22 AG (Advisory Group) meeting. Although it had not been requested, it was developed to demonstrate a spirit of cooperation.

7. ISO/IEC JTC1/SC22 Meeting

SC22 members are very concerned about the way the C language standardization has proceeded. They want to avoid a repeat of the difficulties they have encountered with C standard development. Many view C++ as an extension of C and believe that incompatibilities must be minimized or eliminated completely. Many prefer that a single ISO working group standardize both C and C++.

Two compromises were made so as to afford X3J16 special status in the development of an international C++ standard. First, the list of C and C++ incompatibilities that X3J16 has already agreed to produce must be done in accordance with DTR 10176, *Guidelines for the Preparation of Programming Language Standards*, section 5.5.4. SC22 has requested that JTC1 amend the C++ New Work Item Proposal (NP) accordingly prior to the JTC1 letter ballot on the NP. Although this section is for explaining incompatible language extensions and C++ is not an extension of C, doing the list this way assures the international community that incompatibilities between the two languages are minimized. Tom Plum and Jonathan Shopiro have been given copies of DTR 10176.

Second, X3J16 must change its method of development from type d, national standard development, to type I, international standard development.

I recommend that X3J16 conduct a ballot on the question of requesting that X3 change the project proposal from Type D to Type I. This should be done to allow sufficient time to obtain X3's approval prior to the June 1991 meeting in Lund, Sweden. I also recommend that X3J16 vote to accept the SC22 request that incompatibilities be documented in accordance with DTR 10176, section 5.5.4.

7.1 Type I Development

When a New Work Item Proposal (NP) is approved there is then the question of how the work will be done. The question is answered by establishing "Terms of Reference". An existing working group can do the work or a new working group could be formed. The working group could do the work by itself as in some ISO OSI working groups, or the work could be done mainly by a national member body as C or POSIX has been done, with the advise of the working group. In this later case, a synchronization plan is required to address how the national and international standards will proceed together remaining the same with similar ballot periods. X3 has developed type I development procedures that formalize some of this.

Under type I development X3J16 would produce an international standard with the intent that, when complete, that same standard would be the U.S. national standard. X3J16 would have to petition

X3 to revise the project proposal from Type D to Type I. X3 normally would have no problem approving this request. Consequences would be that only one document would be distributed for public review. U.S. comments received by X3J16 would be used to formulate the U.S. position on the draft standard. The U.S. position comments would be treated by X3J16 on a footing equal to comments from other countries. Hence, both U.S. and other country comments on the draft standard would be considered at the same time. Public review periods would be shortened from 4 months to 2 months. It is likely that the X3J16 document available at the time of the first C++ WG meeting would be the base document.

7.2 SC22 Resolution on C

There was no WG14 representative available to report on status C language standardization. This ~~X~~ resolution was passed:

ISO/IEC JTC1/SC22 Advisory Group requests the SC22 secretariat to communicate with the convener of WG14, Mr P.J. Plauger, and the US member body, expressing the Advisory Group's concern about the absence of representation from WG14 at the Advisory Group meeting and previous SC22 meetings and the lack of the requested synchronization plan and strongly urging the WG14 convener to provide representation and a report at the 1991 Plenary meeting.

7.3 SC22 Resolution on C++

ISO/IEC JTC1/SC22 Advisory Group:

- recommends that SC22 amend the scope of the C++ NP as given in N817 to add the following to the second paragraph of the scope:

"Incompatibilities between C++ and DIS 9899 (and the resulting IS9899), C language, will be handled as described in section 5.5.4 of N656, final version of proposed DTR, Type 3 on: Guidelines for the preparation of programming language standards, now approved for publication as TR 10176; notwithstanding that the formal relationship between C++ and C is not that of a revision of an existing standard."

- recommends the SC22 Secretariat, if and when the new work item is approved, to take the necessary steps to establish a new working group for C++.
- recommends this new working group work closely with the US member body Technical Committee X3J16; such work to be synchronized by X3J16's use of the X3 international development (Type I) process.
- recommends the SC22 Secretariat, if and when the new working group is approved, to confirm the appointment of Mr Steve Carter as Convener of the new working group.

7.4 C++ Convener Recommendations

X3J16 needs vote to change to type I development.

The list of C and C++ incompatibilities must be done in accordance with DTR 10176, section 5.5.4. Although this section is for explaining incompatible language extensions and C++ is not an extension of C, doing the list this way assures the international community that incompatibilities between the two languages are minimized. I have sent a copy to Tom Plum and Jonathan Shopiro.

7.5 C++ Convener Comments

I have looked at a tutorial and the SD-2 on type I development, but ~~X~~ there are still things I don't understand. Scott Jameson, U.S. SC22 TAG delegate and member of X3J16, can answer questions about them. It is a very positive opportunity for X3J16. It is also new ground in international

standards development.

The coordination issues or rules of relationship between X3J16 and an ISO C++ working group are not clear to me. This is an area that needs to be investigated and thought on. I believe X3J16 and the future ISO C++ Working Group have some leeway in defining how they will relate.

I think after some discussion in the International Concerns Working Group things will be a bit clearer. I don't think they will be completely clear until after an ISO C++ working group meets. If the committee is agreeable, I think the International Concerns Working Group can take care of the paperwork to change to type I development.

I am still optimistic that the first ISO C++ working group will meet in Lund June 1991. The schedule is very tight though and there is a possibility that the first meeting will be Toronto November 1991. I am pleased that the X3J16 meeting schedule was changed to accommodate this eventuality.



Steven L. Carter

Chair

International Concerns Working Group

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