

ISO/IEC JTC 1 Subcommittee 22 Chairman's Report

For the Period October, 2003 to September, 2004

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1 Chairman's Report

1.1 Introduction

JTC 1 Subcommittee 22 is responsible for the international standardization of programming languages and of a number of interfaces that are particularly useful for producing portable applications. The most notable portable interfaces are the set of standards being developed for the Portable Operating System Interface for Computer Environments, POSIX and the completed program of work on the Portable Common Tool Environment (PCTE).

Portability is the key objective of Subcommittee 22's standardization efforts. Programming language standards have been contributing to the portability of applications for over three decades. The POSIX environment has added significantly to the ability of users to run applications across vendor and architectural boundaries.

SC22 is standardizing common language independent specifications to facilitate standardized bindings between programming languages and system services, as well as greater interaction between programs written in different languages. SC22 is also addressing the complex area of internationalization, which involves the use of techniques designed to make programs truly portable for users with widely varying international language and cultural backgrounds.

This Chairman's Report is arranged by subgroup and will give a view of the activities and accomplishments of SC22 during the reporting period.

1.2 WG 3 - APL

The working group WG 3 meets only as needed, usually once a year. It works mainly by electronic correspondence. WG 3 suffers from a decline in official support for standardization.

There is need for a new standard for moving data between APL applications. Three APL vendors are cooperating in the implementation of SCAR "Self Contained Array Representation". The APL Character Repertoire has aided in this effort.

Near-term work priorities for APL are:

- (1) APL Character Repertoire

In future, it seems likely that the APL working group will move into a maintenance mode

1.3 WG 4 - COBOL

COBOL continues to be widely used for development and for enhancement and re-engineering of existing applications. Many factors drive the market for COBOL standardization:

Technology advances and the resulting spread of computers to end-users makes it mandatory that computer systems adapt to the languages of users. This gives rise to a need in COBOL for support of large character sets and cultural adaptability. The current draft revision of the COBOL standard includes substantial support for large character sets and cultural adaptability.

The trend in the industry is to web-enable COBOL applications, with COBOL running on a server interacting with a non-COBOL user interface. This gives rise to the need for enhanced interoperability with other programming languages and system services. The current draft revision of the COBOL standard provides a variety of new data types, user-defined functions, and call enhancements.

Market pressure for new technology led COBOL vendors to cooperate on object-oriented design through the standardization process. Early implementations of the object-oriented features in the draft are now available and users are designing them into new applications.

Deployment of applications across workstations and distributed environments and the growth of COBOL in UNIX™ environments generated requirements for new features in the language. COBOL met these needs by implementer extensions to the language, in different ways by different implementers, leading to a need for post-implementation standardization. The draft revision of the COBOL standard includes many of these extensions.

Growth of COBOL in the UNIX™ market led The Open Group to develop a Common Application Environment (CAE) providing a portable definition of features essential in a UNIX™ environment, but lacking in standard COBOL. The need for portability with non-UNIX™ platforms has caused the inclusion of some of these features in the draft.

The current draft COBOL standard addresses many of the market requirements for COBOL, but not all of them. Continued evolution of the international standard for COBOL is essential to provide the benefits of new technologies and new environments to COBOL users worldwide.

WG 4 meets as needed, usually once a year, and works by electronic correspondence between meetings. Five countries are participating in meetings: Germany, Japan, The Netherlands, the UK, and the USA. Detailed technical development is delegated to NCITS J4. J4 has 13 members participating in detailed technical development - 6 COBOL vendor organizations and 7 user organizations.

1.4 WG 5 - Fortran

Fortran is still the language of choice for the majority of scientific and technological programming. The long delay between the release of Fortran 77 and the availability of Fortran 90 compilers, at a time when other languages, such as C and C++, were evolving rapidly, had a significant impact on the use of Fortran. There are now clear signs that the facilities available in Fortran 90 and Fortran 95 are causing a growing number of scientific and technological users to move towards these latest versions of Fortran. Most vendors

have upgraded their Fortran 90 compilers to Fortran 95 and some have incorporated the extensions of TR 15580 and TR 15581.

Most major Fortran compiler vendors are represented either on WG5 or its Primary Development Body, NCITS/J3, as are many of the major research establishments that rely on Fortran for their numerical computing. There are also two active email lists for users of Fortran, which provide valuable feedback from users. All these diverse sources are being used to guide the development of the language, both through revisions to the base language standard, and through other related standards and technical reports.

As elsewhere in the standardization world, it is becoming increasingly difficult to persuade employers to provide the necessary funding for standards activity. WG 5 delegates most of the technical work involved in developing standards and technical reports to 'development bodies'. These are typically a national Fortran committee, as in the case of INCITS J3. J3 is the primary development body responsible for development of the revision to the base language standard and its subsequent maintenance

WG 5 itself carries out much of its discussions via email, with an annual meeting during the summer, and occasional other meetings at critical stages in the development of the base language standard.

WG 5 operates under a strategic plan described in WG 5 Standing Document 4, the latest version of which is WG 5 N1349. In particular, the revision of the base standard, IS 1539-1, is delegated to ANSI NCITS J3 operating as WG 5's Primary Development Body, while the other projects for which WG 5 is responsible are handled by other Development Bodies in liaison with the Primary Development Body as required.

As far as possible, WG 5 tries to anticipate technical comments during international ballots by holding informal ballots of its members before any documents are submitted for ballot. Nevertheless, unexpected technical comments can always delay the planned schedule.

WG5 has made extensive use of email for over a decade to speed up technical development. Since 1995 most documents have been distributed via an official file server in the UK; all documents have been distributed in this way since 1997. An open web site is also used to provide non-technical, and other publicly available, information to interested parties. In addition to speeding up the distribution of documents, the use of electronic distribution and communication systems also provides many other benefits, such as the ability to rapidly carry out informal ballots of the members for various reasons.

WG5 has completed a revision of ISO/IEC 1539-1, Programming Language Fortran, Part 1. It is now under FDIS ballot.

1.5 WG 9 - Ada

Although support for Ada has declined in the US defense sector, Ada remains the language of choice for major parts of the real-time, embedded systems community. Ada usage in other sectors of the marketplace seems to be stable. There is demand for minor

improvements while retaining the stability of the existing language. This motivates WG 9 to update the language standard by means of an Amendment rather than a Revision.

WG9 screens all new work item suggestions with the requirement for active support from five national bodies. This has worked well, resulting in explicit commitments from national bodies supporting a possible project. The Technical Corrigendum document described above is the most important item in WG9's current work program.

1.6 WG 11 - Binding Techniques

There are no clearly defined market requirements for the WG11 projects; however several ISO/IEC standards make reference to the documents. There is thus apparently an indirect market requirement. Despite the sometimes-small participation in WG11, a number of high quality ISO standards have been produced.

WG11 resources have been a problem for the past years, and continue to be so. Attendance is very low, and project editors are difficult to find.

The standard, 10967-2, LIA-2, was published.

SC 22 approved CD registration of WG11;s LIA-3 (Language-Independent Arithmetic). Participation is a clear risk for the progression of the WG11 work. The SC22 Member Bodies are invited to provide resources so that WG11 at least can finalize its current work items.

1.7 WG 14 - C

WG14 feels that it is responding to user community pressure and to implementers concerns by revising the ISO/IEC 9899 standard on schedule. WG14 believes this new ISO/IEC 9899:1999 answers these concerns and keeps the International Standard for the C programming language current with today's programming trends and market. The evolution of object oriented programming, numerical extensions that were proposed by NCITS J11.1, internationalization, advancements in character set standardization, cross-language standards and cross-language bindings all were considered in the newly revised standard. These issues were also taken into consideration when request for the newly approved project JTC 1 NP 18037 was submitted. Most of these issues were not considered during the technical discussions for the original ISO C Standard ISO/IEC 9899:1999. Please, see document ISO/IEC JTC 1/SC22 N2265 "Charter for the Revision of the C Standard" for more details.

WG14 produced the ISO/IEC 9899:1999, a revision of ISO/IEC 9899:1990. WG14 also worked on Defect Reports, keeping the Defect Report Log current. A new work item has also been approved, see ISO/IEC SC22 N3120, a Technical Report type II, "Extensions for the programming language C to support embedded processors".

WG14 meets two times per year in collocated technical sessions with the US committee J11. Over the past year, WG14 has timed its technical sessions to coincide with WG21, allowing those technical experts that would like to attend both technical sessions the opportunity to do so. Twelve countries participate by attending these meetings or by

being involved in the technical discussions that take place over the reflector. The countries are: Australia, Canada, Denmark, France, Germany, Ireland, Japan, Netherlands, Norway, Sweden, UK, and the USA. WG14 has been monitoring the cross-language standards activities, and are using the ISO/IEC JTC 1/WG20 guidelines on extended characters. WG14 has also keep apprised of the requirements of the LIA-1, 2) language independent arithmetic) standards.

WG14 will focus on the new work item JTC 1 NP 18037, a type II technical report, see ISO/IEC SC22 N3120. The Committee discussed several other possible new work items, but has not reached consensus on any of the remaining items yet. The items identified to discuss are:

1. Conformance
2. Sequence Points
3. Time

WG14 will concentrate on the new work item NP 18037, however WG14 will still respond to Defect Report logged for the current ISO/IEC 9899:1999 Standard.

1.8 WG 15 - POSIX

During the 2004 plenary meeting, SC 22 disbanded this working group.

1.9 WG 16 - Lisp

WG 16 observed no market requirement change over this period.

WG16 is developing a list of informal defect reports concerning 13816:1997. Resources to address defect reports are secured (FR and US, and GB and JP as backup).

For the upcoming work period, WG16 will be ready to receive reports on ISO/IEC 13816, and also discuss the opportunity of a five-year revision (to address defect reports, or to introduce extensions e.g. C connection). No deliverables are planned over the next period. Wait for defect reports and organize the work of WG16 depending on the content of these report.

1.10 WG 17 – Prolog

Prolog is a niche language. It is extensively used by a small number of users mainly for applications in configuration, constraint handling and natural language. It is taught in a significant number of universities.

A short list of topics for inclusion in any third part has been prepared. The list is in the process of an email review for decision on the items to be standardized.

Options for future work were discussed at an open meeting held during the Practical Application of Prolog and Constraints programming in London April 1999. A additional email, survey of interested parties produced a list of five topics for potential

standardization. Although some countries indicated a willingness to re-enter the Prolog standardization arena support is still weak.

1.11 WG 19 - Formal Specification Languages

Formal development methods have often been developed in academia. Standardization will give credibility to their work, and encourage their tuition and future developments to be built on sound and common foundations.

The increasing interest in safety-critical systems and in secure systems suggests a continuing interest in the use of formal notations like Z and VDM. Industrial users of the notations continue to exert pressure for standards, and contribute people's time to the work.

Although resources in general are declining, the future of the current WG19 projects seems to be secured. The WG19 mailing list includes experts from Australia, Canada, Denmark, France, Germany, Ireland, Japan, Netherlands, New Zealand, United Kingdom, & USA.

For the upcoming work period, WG19's main task will be to publish ISO/IEC FDIS 13568 and ISO/IEC 13568:2002. WG19 will also start the revision of ISO/IEC 14977.

1.12 WG 20 - Internationalization

During its 2004 plenary meeting, SC 22 disbanded this working group.

1.13 WG 21 - C++

ISO C++ remains a widely-used foundation technology, well-received in the marketplace. WG21 is developing responses to Defect Reports, and has begun work on a Technical Report on C++ Performance.

WG14 meets two times per year in co-located technical sessions with the US committee J16. Over the past year, WG21 has timed its technical Sessions to concatenate with WG14, allowing those technical experts that would like to attend both technical sessions the opportunity to do so. (The convener of WG21 wishes to thank the convener of WG14 for valiant efforts at harmonious liaison.)

Thirteen countries participate by attending these meetings or by being involved in the technical discussions that take place over the reflector. The countries are: Australia, Canada, Denmark, France, Germany, Ireland, Japan, Netherlands, Norway, Sweden, Switzerland, UK, and the USA. WG21 has been monitoring the cross-language standards activities, and made use of the ISO/IEC JTC 1/WG20 guidelines on extended characters.

Due in June 2002 is the PDTR for JTC 1.22.18015 Information Technology Programming Languages Technical Report on C++ Performance (Technical Report Type 3)

WG21 has developed internal procedures for receiving, logging, and Addressing Defect Reports, consistent with JTC1 and SC22 directives. Some new features: the moderators of the newsgroup comp.std.c++ play a role in the initial DR processing, and the WG21 web page provides reasonably current DR status information.

1.14 Project Editors

1.14.1 Basic

No change.

1.14.2 Pascal

No change.

1.14.3 PL/I

No change.

1.14.4 PCTE

No change.

1.14.5 CHILL

No change.

1.14.6 M

No change.

1.15 SC22 Plenary Meeting

SC22 held its sixteenth plenary meeting in Jeju, RoK, during the period September 6-10, 2004. Six National Bodies were represented at the meeting; all are P-members. Seven of the working group conveners was present. Most working group conveners submitted business plans to the plenary. SC 22 approved 35 resolutions during the meeting.

2 Description of ISO/IEC Subcommittee 22

2.1 Title

Programming Languages, their Environments and Systems Software Interfaces

2.2 Area of Work

Standardization of programming languages, their environments and systems software interfaces such as:

- 1 Specification techniques
- 1 Common facilities and interfaces

Excluded: specialized languages or environments assigned to the program of work of another Subcommittee or Technical Committee

2.3 Chairman (Acting)

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2.5 Membership

2.5.1 "P" Members

Austria
Canada
Denmark
France
Italy
S. Korea
Russia
United Kingdom

Belgium
China
Egypt
Germany
Japan
Netherlands
Slovenia
USA

Brazil
Czech Republic
Finland
Ireland
N. Korea
Romania
Ukraine

"O" Members

Argentina
Cuba
Hungary
Indonesia
Norway
Portugal
Singapore
Yugoslavia

Australia
Estonia
Iceland
Israel
New Zealand
Sweden
Thailand

Bulgaria
Greece
India
Italy
Poland
Switzerland
Turkey

JTC 1 Liaisons

SC1, SC2, SC7, SC32.

2.5.4 External Category A Liaisons

ECMA, ITU, FSG

3 Working Groups

3.1 WG 3 APL

Title	APL
Convener	L. Dickey (Canada) (Acting)
Terms of Reference	Development of ISO standards for Programming Language APL and Extended APL.

3.2 WG 4 COBOL

Title	COBOL
Convener	D. Schricker (USA)
Terms of Reference	Coordinate the development of ISO standards for Programming Language COBOL. Coordinate the development of draft amendments for language extensions to ISO 1989.

3.3 WG

5 Category C Liaison

For tran

Title	Fortran
Convener	J. Reid (UK)
Terms of Reference	Coordinate the revision of ISO 1539, Programming Language Fortran.

3.4 WG 9 Ada

Title	Ada
Convener	J. Moore (USA) (Acting)
Terms of Reference	Development of ISO standards for Programming Language Ada

3.5 WG11 Binding Techniques & Language Independent

Title	Binding Techniques
Convener	W. Wakker (Netherlands)
Terms of Reference	Study binding issues between programming languages and the abstract facilities with which they interface or interact, and to propose, develop and maintain ISO/IEC standards in this area.

3.6 WG 14 C

Title	C
Convener	J. Benito (USA)
Terms of Reference	Coordinate the content of an ISO standard for Programming Language C.

3.7

WG 16 Lisp

Title	Lisp
Convener	T. Yuasa (Japan)
Terms of Reference	Coordinate the content of an ISO standard for Programming Language Lisp.

3.8

WG 17 Prolog

Title	Prolog
Convener	J. Hodgson (USA)
Terms of Reference	Coordinate the content of an ISO standard for Programming Language Prolog

3.9 WG 19 Formal Specification Languages

Title	Formal Specification Languages
Convener	R. Scowen (UK) (Acting)
Terms of Reference	Develop and coordinate the content of ISO standards for formal specification languages within the scope of SC22

3.10 WG 21 C++

Title	C++
Convener	H. Sutter (USA)
Terms of Reference	Coordinate the development of an ISO standard for Programming Language C++.

4 Program of Work

Provided in a separate document.