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Data Management Services

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REPLACES

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ISO/IEC JTC 1/SC 32 Project Subdivisions and Withdrawals (Approved at
October 1997 JTC 1/SC 21 Plenary Meeting, Vancouver, BC, Canada)

SOURCE:
JTC 1/SC 21 JTC 1 October 1997 Plenary Meeting

PROJECT:

STATUS:
This document is being circulated to JTC 1/SC 32 for information and
submission to JTC 1 for endorsement.

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DUE DATE:

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Recommendation WG3.18 Cancellation/Suspension of Projects

SC 21/WG X approves the project cancellations and suspensions shown below for the reasons indicated, and requests the SC 32 Secretary to forward the list to JTC 1 and ITTF for action, as appropriate.

Project #	Designation	Title	Recommendation and Rationale
1.21.3.4.8	9075-8	SQL Part 8, Extended object support for SQL	Content absorbed into 9075-1,9075-2,9075-3, 9075-4,9075-5
1.21.31.3.2	9579-3/2	RDA Part 3: RDA SQL PICS Proforma Amendment 2	See 3N2012 / 21N11086 (Attachment A)
1.21.31.1.2	9579-1/2	RDA Part 1: Amendment 2 Extensions for new market requirement	See 3N2012 / 21N11086 (Attachment A)

Recommendation WG3.22 Subdivisions of Projects

SC 21/WG X approves the administrative project subdivisions shown below for the reasons indicated, and requests the SC 32 Secretary to forward the list to JTC 1 and ITTF for action, as appropriate.

Previous Project #	Proposed Project #s	Editors	Proposed Designations	Proposed Titles	Rationale
1.21.3.4	1.21.3.4.10 see Note 1	Jim Melton	9075-10 see Note 1	Database Language SQL:, Part 10: Object Language Bindings	See 3N2105 / 21N1115 (See Attachment B)
1.21.31.4 see Note 2	1.21.31.4.1	John Hadjioannou	9579:199x/1 (Amd 1 to first edition of RDA without parts)	Remote Database Access for SQL (RDA/SQL) – Amendment 1 - Secure RDA	See 3N2012 / 21N11086: Strategic directions for RDA (See Attachment A) and 3N2095 / 21N11087: Rationale for organizing RDA projects. (See Attachment C)

1.21.31.4 see Note 2	1.21.31.5	John Hadjioannou	9579: xxxx (second edition of RDA without parts	Remote Database Access for SQL 4 th Edition – Support for SQL3	See 3N2012 / 21N11086: Strategic directions for RDA (See Attachment A) and 3N2095 / 21N11087: Rationale for organizing RDA projects (See Attachment C)
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Note 1: The specified project number is chosen to maintain consistency with NB standards and allow for future NB proposals

Note 2: This is the revised number, according to resolution 3.20.

Note 3: NBs committed to participating are: Canada, Italy, Japan, UK, USA

Title: Remote Database Access - Strategic Directions
Source: RDA Rapporteur Group
Status: RDA Standing Document
Date: 21 May 1996
Requested Action: Approval and circulation to SC21 for study and comment

1. Current status

RDA provides a protocol that enables a database client to gain access to database servers. Specifically, RDA supports the ISO SQL database language standards.

The first edition of the RDA was published in 1993 as ISO/IEC 9579-1 and -2 to support the 1989 edition of SQL. A new, upwardly compatible version of the standard designed to support SQL92 has completed CD editing. It is expected to achieve IS status in late 1996 or early 1997 depending upon meeting schedules.

RDA technology is now feasible, economically viable, products are appearing and it is in some cases becoming the protocol of choice for database procurement. RDA technology promises to open up formerly closed vendor-proprietary marketplaces, enabling interworking in heterogeneous environments.

To encourage further implementation and adoption of this standard and to focus future work, this paper aims to present a strategic direction for future developments to meet the evolving needs of the database marketplace.

2. Remote Database Access standardisation

In order to provide a standard for heterogeneous interworking, RDA standardisation has concentrated on defining the communication protocol (on the wire) between an RDA client and an RDA server. RDA can therefore be used between an SQL client and SQL server in order to provide remote access to the data under the control of that server. RDA is an asymmetric point-to-point protocol. In a multi-server environment such as illustrated below there is an RDA component relating to each connection between the SQL client and the SQL server.

SQL standardisation has concentrated on defining the interface to the SQL client, which it has done in terms of language and bindings, and SQL server functionality.

The positioning of the current standardisation work and the relationship between RDA standards and SQL can be shown in the following processor diagram:

3. Future Work

Experience with RDA standard development, implementation experience and field use have identified areas where future work is necessary, some of which involves standardization of currently unstandardized interfaces shown in the above model.

These have been ordered in terms of current market priority.

3.1 Transport Independence

Potential users of RDA are immediately confronted with the problem of an OSI Application Layer protocol which assumes an OSI conformant lower layer stack when, in virtually all potential applications of RDA, TCP/IP is the underlying transport stack. Many potential users are dissuaded by their lack of expertise in obtaining, developing or implementing mapping software to alleviate this problem. The RDA Rapporteur Group plans to address the issue of mapping one-phase commit and two phase commit versions of RDA to a TCP/IP transport stack, and plans to explore potential collaboration with IETF on this matter.

3.2 Application Programming Interface for SQL-RDA

The RDA RG has identified that a major inhibitor to the development of RDA technology components has been the lack of a standardized Application Programming Interface for invocation of SQL-RDA. The RDA RG proposes that this work should be progressed as much as possible based on the requirements of the SQL92 SQL/CLI. An essential part of this work is the explicit mapping of the proposed SQL-RDA API to the RDA protocol data units.

3.3 Heterogeneous Interoperation

In a heterogeneous environment interoperation issues arise as a result of implementation defined and implementation dependent features and facilities. Since it is the goal of RDA to provide the facilities that enable heterogeneous interworking, the RDA rapporteur group wishes to ensure that mechanisms are in place whereby clients are able to determine sufficiently the characteristics of servers that they connect to.

3.4 Encoding Flexibility

RDA currently restricts the protocol encoding to BER. Efficiency gains can be achieved by relaxing this requirement. The RDA rapporteur group wishes to take advantage of this and other ASN.1 enhancements in such a way as to minimise confusion in the marketplace through provision of many options and at the same time to preserve upward flexibility.

3.5 Secure Database Access

Many applications of database technologies have significant requirements for security of data, which involves many issues relating to authentication, access control, etc. It is essential that security is applied across all components of a system so that there are no weak links.

The SQL standard provides access control in isolation from other system components. It requires that each user is associated with an authorization identifier; the relationship between an authorisation identifier and any other system user identifier, and its authentication, is undefined. The RDA standard provides no further security facilities. As an OSI standard, RDA could adopt existing OSI security facilities, in particular, x509 based public key infrastructure facilities may be appropriate, but there is a need to determine how these may be related to SQL access control. This would constitute a profile, specifying how existing standards can be used in combination to provide secure database access.

Alternatively, with work to make RDA transport independent, it may be appropriate to develop extensions to RDA to provide its own security facilities.

3.6 Tracking SQL developments beyond SQL92

The RDA RG plans to track the SQL developments being made within the DBL group as they stabilise and to be as responsive as possible in providing incremental enhancements to the RDA facilities to support SQL developments where there is a market need. The transfer of ADTs to support SQL/MM applications, particularly spatial, has been identified as one such facility.

3.7 Ad Hoc RDA

The RDA RG plans to address the requirement to obtain the results of a single ad-hoc query of a remote database in one protocol exchange.

This extension will enable RDA to address the WWW and email type of access, which is typically a one-off query to a server whose database management system may be unknown. This is in addition to the use of RDA to address current transactional requirements. This will build on the current RDA technology possibly by concatenating the relevant RDA PDUs. Further clarification is required before work can begin in this area.

3.8 Distributed Database

The RDA RG plans to define the SQL to SQL-RDA API mapping. This is a subset of the distribution controller functionality needed for such purposes as distributed query and transaction management.

In the short term, this amounts to the mapping between the SQL/CLI and the SQL-RDA API, including provision for concurrent access to more than one SQL server and consideration of the manner in which SQL client functionality

defined in ISO/IEC 9075 relates to such distributed query and transaction facilities. It will be appropriate to define an SQL distribution schema within this work-item

3.9 Table Transport Encoding

The RDA Rapporteur Group plans to factor out the table transport components of the RDA protocol so as to make these available to other standards such as SQL Export Import and to address the issue of ASN.1 optimizations, specifically, an efficient encoding of multiple rows and the optional use of Packed Encoding Rules in place of BER.

The RDA RG plans to address this requirement with reference to ISO/IEC JTC1/SC21 N9735 - Working Draft Amendment on Run-time Parameters for ISO/IEC 8824-4, ASN.1 - Specification of Basic Notation and 8825-2, ASN.1 - Encoding Rules expected to have CD status in May 1996.

4. Technical Liason

In order to ensure that information relating to ISO remote database access is available and easily accessible the RDA rapporteur group has agreed to develop and maintain appropriate overview material highlighting the RDA standards development activities and participation, the architectural foundation and appropriate tutorial information in the form of a Frequently Asked Questions (FAQ) document.

This will be made available through a WWW site whose URL will be made available in due course.

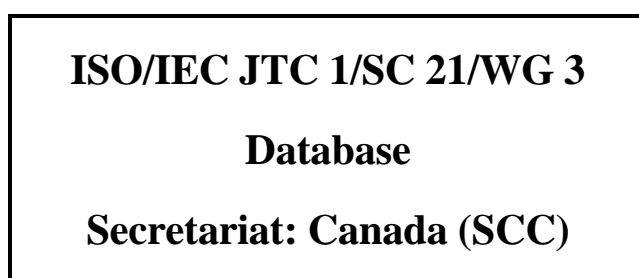
The RDA rapporteur group seeks further to establish liasons with IETF, OIW, x/open and other organisations working in this field.

5. Requested Action

National Bodies are asked to make technical contributions towards the work-items peresented here by 15 November 1996 in time for the January interim meeting and to comment on this strategic plan if appropriate.

ISO/IEC JTC1/SC21/WG3 **N2105**
ISO/IEC JTC1/SC21/WG3 **DBL:LGW-153**
X3H2-97-329

1 August, 1997



Title: Bindings to Object-Oriented Languages — Proposal for new SQL Subproject

Source: ISO/IEC JTC1/SC21/WG3 Database Languages Rapporteur Group

Project: ISO/IEC 1.21.3.4 (SQL3)

Status: Proposal to SC21/WG3 Closing Plenary — London, England, UK (LGW meeting)

References:

1. ISO/IEC 9075:1992, *Information Technology — Database Languages — SQL*, November, 1992
2. ISO/IEC JTC1/SC21/WG3 DBL:LGW-082, *Proposing a Part for Bindings to Object-Oriented Languages*, June, 1997
3. ISO/IEC JTC1/SC21/WG3 DBL:LGW-125, *JSQL: Embedded SQL for Java*, 23 June, 1997
4. SC21 N8091, Elaboration of the Scope and Content of Project 1.21.3.4 (SQL3), dated 30 June, 1993, also distributed as document WG3 N1455, dated 20 November, 1992.
5. SC21 N7727, Criteria for NP's and Program Extensions, dated April 1993.

Discussion

Reference [2] initiated the discussion in WG3 regarding standardizing of a new SQL subproject to support the embedding of SQL into the emerging *de facto* (and possibly *de jure*) standard for the Java programming language (and implicitly — though not explicitly — other object-oriented programming languages such as C++). The proposed project should be

urgently pursued in support of work already at CD stage related to SQL and the object paradigm. Java is one of the most widely used languages of its age in the history of computing and making access to SQL data through Java is a vital aspect of support of that language. A new subproject of the SQL project is proposed to be initiated as soon as possible; the subproject's scope would be the specification of embedded SQL facilities for object-oriented languages. These facilities are expected to be different enough from the existing embedded SQL facilities for non-object-oriented languages that it is felt to be inappropriate to do this work in the scope of subproject 1.21.3.4.5.

Therefore, it is intended that these facilities be specified in a new Part of ISO/IEC 9075 and that conformance to that Part be optional, but predicated on conformance to other parts of ISO/IEC 9075 (particularly parts 2 and 5).

While C++ is the subject of an International Standard, the status of Java in the contexts of international standardization is presently uncertain, but there are efforts underway to progress Java to International Standard status. Although the results of those efforts are not yet known — and are unlikely to be finalized for some months in any case, Java is so clearly a standard in the marketplace that work related to SQL embeddings in the language are inherently meaningful and urgent.

To this end, WG3 seeks to extend SC21 Project 1.21.3.4 (SQL3) to add a new Subproject for a separate Part of SQL3 that will provide the necessary facilities for embedding SQL in programs written in object-oriented programming languages.

Needs

Database Language SQL (ISO/IEC 9075) currently has no support for bindings to any object-oriented language. In order to maximize the value of the extensive support that SQL is gaining for the object paradigm, providing at least some form of such binding is mandatory. The clearest market requirements are for a CLI-like binding and for an embedded binding. The present proposal addresses only the second such requirement: an embedded binding. The SQL3 Project [4] already authorizes further development of Database Language SQL, including language bindings, so the present proposal is recognized to be within the scope of that project.

Existing Practice

Due to the relatively recent appearance of Java in the marketplace, existing practice is still new. That is, there are few entrenched practices that would cause problems related to this proposed subproject. Indeed, as practice in the marketplace is emerging, the participants in the SQL3 project are watching and participating actively to ensure that developing practice progresses in ways that are aligned with the goals of the proposed subproject.

Expected Stability

In the same manner that the specifications of the Java language stabilized quite rapidly, the specifications for embedding SQL into Java programs is expected to stabilize very quickly.

Program of Work

Specify a new Part of the emerging SQL3 standard, *e.g.*, Part 10, *Object Language Bindings* (SQL/OLB), to specify the technique for embedding SQL statements into object-oriented programming languages, such as Java and C++.

Justification for Subproject Request

Reference [5] identifies SC21 requirements for approval of program extensions (subdivisions and minor enhancements) of existing SC21 projects. DBL RG supports the subdivision of the existing SQL3 Project (1.21.3.4) [4] as follows:

1. The rationale for the SQL Object Language Bindings extension of Database Language SQL is given in the "Needs" and "Existing Practice" paragraphs above. This proposed work is within the scope of already-authorized work in the SQL3 project description for "additional data types".

2. DBL RG consensus on the need to do this work is evident from the WG3 DBL RG participant positions taken at the DBL RG meeting in London, UK, in July, 1997 at the so-called LGW meeting.
3. Substantial input to an initial candidate base document [3] has been produced and made available in preparation for the SC21 meetings in September, 1997; [3] is available electronically in the WG3 FTP archives. It is believed that this input document forms a solid foundation for a candidate base document, which could then be made available within a few months following subproject approval. The WG3 Database Languages rapporteur group is uniquely qualified to address and resolve issues specific to SQL implementations.
4. The SQL editor, Mr. Jim Melton, is willing to be the subproject editor for Database Language SQL — Part 10: Object Language Bindings (SQL/OLB).

ISO/IEC / JTC 1 / SC 21 / WG3 N 2095

Title: Rationale for the reorganising of RDA projects
Source: RDA
Date: 25 July 1997

References:

[1] WG3 N 2012, Strategic Directions for RDA

The scope of the RDA development is in [1] which outlines the features and facilities required to support new market requirements.

The work is currently divided across three subprojects:

- 1.21.31.1.2 RDA Generic
- 1.21.31.2.2 RDA SQL Specialisation
- 1.21.31.3.2 RDA SQL PICS proforma

One of the requirements in [1] is to eliminate the Generic / Specialisation / PICS division and focus on SQL support. Accordingly, it is requested that projects 1.21.31.1.2 and 1.21.31.3.2 be cancelled.

The scope defined in [1] has three aspects:

- Remote Database Access for SQL
- Framework and specification for secure remote database access
- Tracking of SQL beyond SQL92

To support these three aspects it is requested that the project 1.21.31.2.2 be split into three subprojects:

- 1.21.31.4 Remote Database Access for SQL (RDA/SQL)
- 1.21.31.4.1 Secure RDA
- 1.21.31.5 Remote Database Access for SQL3

The scope of these three subprojects continues to be contained within [1].

This proposal is supported by all five NBS participating in the July RG meeting, namely Canada, Italy, Japan, UK and US.

The RDA Programme of Work, with all proposed changes, is shown in Attachment 1.

6. Proposed Programme of Work for RDA Projects

31.01.00.00.00

ISO/IEC 9579-1 : 1993

IT - RDA - Part 1: Generic Model, Service and Protocol

Notes: Published. To be withdrawn upon publication of 9579:199X, IT- RDA for SQL (Edition 1 of RDA without parts).

31.01.02.00.00

ISO/IEC 9579-1 : 1993/NP 2

IT - RDA - Part 1: Generic Model, Service and Protocol - Amendment 2: Extensions to support new market requirements

Notes: Recommended for cancellation

31.02.00.00.00

ISO/IEC 9579-2 : 1993

IT - RDA - Part 2: SQL Specialization

Notes: Published. To be withdrawn upon publication of 9579-2:199X, IT - RDA - SQL Specialization, Second Edition.

31.02.01.00.00

ISO/IEC 9579-2 : 1993/DAM 1

IT - RDA - Part 2: SQL Specialization - Amendment 1: Support for SQL 92

Notes: SC 21 N 11060 text for publication as 9579-2:199X, IT - RDA - SQL Specialization, Second Edition. To be withdrawn upon publication of 9579:199X, IT - RDA for SQL (Edition 1 of RDA without parts).

31.02.02.00.00

ISO/IEC 9579-2 : 1993/WD 2

IT - RDA - Part 2: SQL Specialization - Amendment 2: Extensions to support new market requirements

Notes: Renumbered as 31.04.00.00.00. See below.

31.03.00.00.00

ISO/IEC 9579-3:1996

IT - RDA - Part 3: SQL PICS Proforma

Notes: Published

31.03.01.00.00

ISO/IEC DIS 9579-3/NP 1

IT - RDA - Part 3: SQL PICS Proforma - Amendment 1: Support for SQL 92

Notes: Recommended for cancellation

31.03.02.00.00

ISO/IEC DIS 9579-3/NP 2

IT - RDA - Part 3: PICS Proforma - Amendment 2: Extensions to support new market requirements

Notes: Recommended for cancellation

31.04.00.00.00

ISO/IEC 9579-2 : 1993/WD 2

IT - RDA - Part 2: SQL Specialization - Amendment 2: Extensions to support new market requirements

Notes: Renumbered from 31.02.02.00.00. Current draft in SC 21 N10954. To be published as 9579:199X, IT - RDA for SQL (Edition 1 of RDA without parts) replacing 9579-1:1993, 9579-2:199X, 9579-3:1996. FCD text forthcoming in RDA-LGW-33R1. To be withdrawn upon publication of 9579:XXXX, IT - RDA for SQL (Edition 2 of RDA without parts).

31.04.01.00.00

ISO/IEC 9579:199X/Amd. 1

IT - RDA for SQL - Amendment 1: Secure RDA

Notes: To proceed as an amendment to 9579:199X, IT- RDA for SQL (Edition 1 of RDA without parts).

Project split requested.

31.05.00.00.00

ISO/IEC 9579:XXXX

IT - RDA for SQL

Notes: To be published as 9579:XXXX, IT- RDA for SQL (Edition 2 of RDA without parts) replacing 9579:199X (Edition 1 of RDA without parts) and 9579:199X/Amd. 1. Project split requested.