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**Information technology — Remote  
database access for SQL with security  
enhancement**

*Technologies de l'information — Accès à la base de données à distance  
pour SQL avec sécurité accrue*

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# Contents

<b>Contents</b> .....	<b>iii</b>
<b>Tables</b> .....	<b>viii</b>
<b>Figures</b> .....	<b>ix</b>
<b>Foreword</b> .....	<b>x</b>
<b>Introduction</b> .....	<b>xi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative References</b> .....	<b>3</b>
2.1 International Standards.....	3
2.2 Internet Engineering Task Force.....	3
2.3 Institute of Electrical and Electronics Engineers.....	4
<b>3 Interoperability</b> .....	<b>5</b>
3.1 Interoperability between implementations.....	5
3.2 Interoperability with conforming OSI implementations.....	5
3.3 Interoperability with future editions .....	5
<b>4 Definitions, Conventions and Notations</b> .....	<b>6</b>
4.1 Definitions.....	6
4.2 Conventions.....	7
4.2.1 Convention for Figures .....	7
4.2.2 Naming of Concepts .....	7
4.2.3 Naming of Parameters.....	7
4.2.4 Specification of RDA Protocol, RDA Operations and RDA encoding elements .....	7
4.2.5 Evaluation of Rules.....	7

4.3	Notations .....	9
4.3.1	SQL/CLI functions .....	9
4.3.2	Implicit encoding definitions.....	9
4.3.3	Encoding Attributes .....	9
4.3.4	Notation for encoding syntax .....	9
<b>5</b>	<b>Model and Facilities.....</b>	<b>10</b>
5.1	Model.....	10
5.2	The RDA-client environment.....	11
5.2.1	Service User .....	11
5.2.2	SQL-client Services .....	11
5.2.3	RDA-client Services .....	12
5.2.4	Transport Mapping .....	12
5.2.5	RDA-client .....	12
5.2.6	RDA Location Server.....	13
5.3	The RDA-server environment .....	14
5.3.1	Transport Mapping .....	14
5.3.2	RDA-server Services .....	14
5.3.3	RDA-server .....	15
5.3.4	SQL-server .....	15
5.3.5	RDA Support Server.....	15
5.4	RDA concepts and the mapping of SQL/CLI concepts.....	16
5.4.1	Application Communication Areas.....	16
5.4.1.1	Attributes.....	16
5.4.1.2	Diagnostics areas.....	16
5.4.1.3	Descriptor areas .....	16
5.4.2	SQL_TEXT .....	17
5.4.3	SQL-session and SQL-connection.....	17
5.4.4	SQL User Name and Password.....	17
5.4.5	Multi-site Transactions.....	17
5.4.6	SQL/CLI Handles .....	17
5.4.7	Connection Ident.....	18
5.4.8	Statement Ident .....	18
5.4.9	Request Ident.....	18
5.4.10	Encodings .....	18
5.5	RDA Model of Transport .....	19
5.5.1	Transport Provider .....	19
5.5.2	Transport Address.....	19
5.5.3	Destination SQL-server Name.....	19
5.5.4	Transport Connection.....	19
5.5.5	Transport Facilities .....	19
5.6	RDA Facilities for Transport Connections.....	21
5.6.1	RDA Suspend and Resume Facility.....	21
5.6.2	RDA Encoding Facility.....	21
5.7	RDA Facilities for Transaction Co-ordination .....	22
5.7.1	RDA Transaction Co-ordination Facility .....	22

5.8	RDA Facilities for Security .....	23
5.8.1	RDA Security Services .....	23
5.8.2	Use of Transport Provider security facilities .....	23
5.8.3	Use of Authentication in RDAConnect.....	24
5.8.4	Use of MessageAuthentication in RDAMessage.....	24
<b>6</b>	<b>RDA Protocol .....</b>	<b>26</b>
6.1	The RDA Protocol Exchange .....	26
6.2	RDAMessage.....	27
6.2.1	RDAMessage protocol element.....	27
6.2.2	MessageAuthentication encoding element.....	30
6.3	Invocation of RDA Operations .....	32
6.3.1	Invocation of the Request in the RDA-client environment .....	32
6.3.2	Evaluation of the Request in the RDA-server environment .....	33
6.3.3	Invocation of the Response in the RDA-server environment.....	34
6.3.4	Evaluation of the Response in the RDA-client environment.....	35
6.3.5	Transport Fail Indication .....	35
<b>7</b>	<b>RDA Operations.....</b>	<b>37</b>
7.1	RDA request operations .....	37
7.1.1	RDAConnect Operation .....	37
7.1.2	RDADisconnect Operation.....	40
7.1.3	RDAEndTran Operation .....	41
7.1.4	RDAClientAttribute Operation.....	43
7.1.5	RDAStatementPrepare Operation .....	44
7.1.6	RDAStatementDeallocate Operation .....	45
7.1.7	RDAStatementExecute Operation .....	46
7.1.8	RDAStatementExecDirect Operation .....	49
7.1.9	RDAStatementFetchRows Operation .....	50
7.1.10	RDAStatementCloseCursor Operation .....	52
7.1.11	RDAStatementCancel Operation.....	53
7.1.12	RDASetCursorName Operation .....	54
7.1.13	RDAGetCursorName Operation.....	55
7.1.14	RDAGetInfo Operation.....	56
7.1.15	RDAGetTypeInfo Operation .....	57
7.2	RDA response encoding element.....	58
7.3	Encoding components .....	62
7.3.1	RDAAttribute encoding element .....	62
7.3.2	RDADiagnostic and RDADiagnosticStatus encoding elements.....	65
7.3.3	RDAItemDescriptor encoding element.....	66
7.3.4	RDARow and RDAValue encoding elements.....	68
<b>8</b>	<b>Exceptions .....</b>	<b>69</b>
8.1	Exception codes for RDA-specific Conditions.....	69

8.2	Exception Behaviour.....	70
<b>9</b>	<b>Encodings.....</b>	<b>71</b>
9.1	The Base Encoding.....	72
9.2	The ASN.1 PER Encoding.....	73
<b>10</b>	<b>Transport Mappings.....</b>	<b>74</b>
10.1	Mapping to TCP/IP.....	75
10.1.1	Transport Address.....	75
10.1.2	Mapping of Transport Connect.....	75
10.1.3	Mapping of Transport Disconnect.....	75
10.1.4	Mapping of Transport Fail.....	75
10.1.5	Mapping of Transport Send.....	75
10.1.6	Mapping of Transport Receive.....	75
10.1.7	Mapping of Transport Errors.....	75
10.1.8	Default Encoding.....	75
10.2	Mapping to TLS.....	76
10.2.1	Mapping of Transport Connect.....	76
10.2.2	Mapping of encodings.....	76
10.2.3	Mapping of Transport Errors.....	76
10.2.4	Provision of mandatory security facilities.....	76
10.2.5	Provision of optional security facilities.....	76
<b>11</b>	<b>Conformance.....</b>	<b>77</b>
11.1	RDA-client Conformance.....	77
11.2	RDA-server Conformance.....	77
11.3	Claims of Conformance.....	77
<b>Annex A</b>	<b>Conformance Proforma.....</b>	<b>79</b>
A.1.	Identification.....	79
A.2.	Supplier Details.....	79
A.3.	Implementation Details.....	80
A.4.	RDA Support.....	80
A.5.	Optional facilities for RDA-clients only.....	81
A.6.	Optional facilities for RDA-servers only.....	82
<b>Annex B</b>	<b>RDA Programming Interface.....</b>	<b>83</b>
B.1.	Notation for defining RDA/API functions.....	84
B.2.	Mapping RDA/API to a programming language.....	84
B.3.	Transport Handles.....	84

B.4.	Transport Mapping Codes .....	84
B.5.	Transport Connection Management.....	85
B.6.	RDA/API functions.....	85
B.7.	RDA/API function invocation .....	85
B.8.	RDA/API function parameters .....	86
<b>Annex C Mapping of SQL/CLI .....</b>		<b>93</b>
C.1.	SQLDisconnect.....	94
C.2.	SQLEndTran .....	94
C.3.	SQLSetConnectAttr, SQLSetStmtAttr and SQLSetEnvAttr.....	94
C.4.	<set transaction statement> .....	95
<b>Annex D RDA Location Server .....</b>		<b>97</b>
D.1.	RDA Location Server name and schema .....	97
D.2.	Server Location Table.....	98
<b>Annex E RDA Support Server .....</b>		<b>99</b>
E.1.	RDA Support Server name and schema.....	99
E.2.	Server Information Table .....	99
E.3.	Request Log Table.....	101
<b>Annex F Security Service Requirements .....</b>		<b>103</b>
F.1.	Potential Vulnerabilities.....	103
F.2.	Authentication .....	104
F.3.	Access Control.....	105
F.4.	Transfer Integrity .....	106
F.5.	Transfer Confidentiality .....	106
F.6.	Storage Integrity .....	106
F.7.	Storage Confidentiality .....	107
F.8.	Non-repudiation.....	107
<b>Annex G Security Profiles.....</b>		<b>109</b>
<b>Annex H RDA Operations and Protocol in ASN.1 notation .....</b>		<b>111</b>
<b>Annex I Encoding of Multiple Rows .....</b>		<b>115</b>

## Tables

Table 1–Codes used to identify the protocol .....	27
Table 2–Codes used to identify the protocol version .....	27
Table 3–Codes used to identify an RDA message type.....	28
Table 4–Use of MessageAuthenticateParameters .....	31
Table 5–Extension to Table 14 of ISO/IEC 9075-3 .....	41
Table 6–Codes used for attribute types .....	62
Table 7–Codes used for RDA defined Connection Attributes.....	62
Table 8–Prohibited attributes.....	63
Table 9–Extension to Table 19 of ISO/IEC 9075-3.....	63
Table 10–Values of Statement Ident .....	64
Table 11–RDADescriptorEntries required for SQL Data Types .....	66
Table 12–SQLSTATE class and subclass values for RDA-specific conditions .....	69
Table 13–RDAResponse Parameter settings for RDA generated conditions.....	70
Table 14–Codes used to identify TCP/IP encoding .....	71
Table 15–Transport Mappings.....	74
Table 16–Transport Mapping Codes.....	84
Table C.1–RDA Operations invoked when evaluating an SQL/CLI function.....	93
Table G.1–Security Profiles – Facilities Used.....	109
Table G.2–Security Profile – Services Provided.....	109



## Figures

Figure 1–RDA model of SQL-environment .....	10
Figure 2–Model of the RDA-client environment.....	11
Figure 3–Model of the RDA server environment .....	14

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## Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

### iTeh STANDARD PREVIEW

International Standard ISO/IEC 9579 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 32, *Data management and interchange*.

This second edition cancels and replaces the first edition (ISO 9579:1999), which has been technically revised.

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Annexes A to E and G form a normative part of this International Standard. Annexes F, H and I are for information only.

## Introduction

Remote Database Access for SQL (RDA/SQL) International Standard is a member of a set of International Standards produced to facilitate the interworking of computer systems. This International Standard conforms to the model defined in ISO/IEC 10032, *Information technology – Reference Model of Data Management*.

Remote Database Access for SQL can be used to provide remote data access to a database management system conforming to ISO/IEC 9075 (Database Language SQL).

The goal of Remote Database Access for SQL is to allow, with a minimum of technical agreement outside this International Standard, the interconnection of applications and database systems:

- from different manufacturers,
- under different managements,
- of different levels of complexity,
- exploiting different technologies.

An application may itself be a database system and therefore this International Standard can be used to support multi-database system interworking.

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# Information technology — Remote database access for SQL with security enhancement

## 1 Scope

This International Standard, Remote Database Access for SQL (RDA), defines a model for the remote interaction of an SQL-client and one or more SQL-servers through communication media, and defines the encoding of messages, the semantics of messages and associated facilities for mediating the interaction between one SQL-client and one SQL-server.

This International Standard also defines a mapping of the RDA Protocol to the specific communication infrastructures TCP/IP and Transport Layer Security (TLS).

This International Standard relies upon the facilities provided by ISO/IEC 9075 (SQL) and ISO/IEC 9075-3 (SQL/CLI).

This International Standard also:

- identifies potential security vulnerabilities in remote database access using RDA,
- defines RDA facilities which protect against the potential vulnerabilities.

Normative annexes provide:

- a Conformance Proforma,
- an optional language independent Application Programming Interface defined in the notational conventions of ISO/IEC 9075-3 (SQL/CLI) for invoking RDA Operations,
- an optional mapping of ISO/IEC 9075-3 (SQL/CLI) functions to RDA Operations,
- definitions of optional SQL-servers, the RDA Location Server and the RDA Support Server, to facilitate interoperation and data distribution in a heterogeneous environment,
- a set of security profiles that identify which RDA facilities and other security facilities are required for different levels of protection against potential vulnerabilities.

Informative annexes provide:

- an analysis of security service requirements,
- an ASN.1 specification for the RDA Protocol,
- an ASN.1 specification for the encoding of multiple rows.

This International Standard does not constrain:

- conforming RDA-client environments to be implemented using any particular processor decomposition,
- conforming RDA-server environments to be implemented using any particular processor decomposition.

This International Standard refers to but does not define:

- protocols and security mechanisms for communication confidentiality, integrity and authentication of communicating peers,
- digital signature and authentication mechanisms supported by protocol elements of RDA.

This International Standard does not define:

- algorithms for query decomposition or for the combining of results in a distributed database environment,
- mechanisms for recovery in the event that transaction co-ordination fails,
- mechanisms for storage integrity and confidentiality using cryptography,
- mechanisms to counter Denial of Service attacks.

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## 2 Normative References

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

### 2.1 International Standards

- ISO/IEC 8824-1:1995 *Information technology – Abstract Syntax Notation One (ASN.1): Specification of basic notation*
- ISO/IEC 8825-1:1995 *Information technology – ASN.1 encoding rules: Specification of Basic Encoding Rules (BER), Canonical Encoding Rules (CER) and Distinguished Encoding Rules (DER)*
- ISO/IEC 8825-2:1996 *Information technology – ASN.1 encoding rules: Specification of Packed Encoding Rules (PER)*
- ISO/IEC 7498-2:1989 *Information processing systems – Open Systems Interconnection – Basic Reference Model – Part 2: Security Architecture*
- ISO/IEC 9075:1992 *Information technology – Database Languages SQL*
- ISO/IEC 9075-3:1995 *Information technology – Database Languages SQL – Part 3: Call Level Interface*
- ISO/IEC 9075-4:1996 *Information technology – Database Languages SQL – Part 4: Persistent Stored Modules*
- ISO/IEC 9594-8:1995 | ITU-T Recommendation X.509  
*Information technology – Open Systems Interconnection – The Directory: Authentication Framework.*
- ISO/IEC 10032:1995 *Information technology – Reference Model of Data Management*
- ISO/IEC 10646-1:1993 *Information technology – Universal Multiple-Octet Coded Character Set (UCS) – Part 1: Architecture and Basic Multilingual Plane*

### 2.2 Internet Engineering Task Force

- RFC 791 *Internet Protocol*
- RFC 793 *Transmission Control Protocol*
- RFC 819 *The Domain Naming Convention for Internet User Applications*
- RFC 1122 *Requirements for Internet Hosts – Communication Layers*
- RFC 1123 *Requirements for Internet Hosts – Application and Support*
- RFC 2246 *The TLS Protocol*

Internet Engineering Task Force standards may be obtained in electronic form from the InterNIC Directory and Database Services at <http://www.internic.net> and <ftp://ftp.internic.net>.