

ISO/IEC JTC 1/SC 32 N 0284

Date: 1999-05-21

REPLACES: --

<p style="text-align: center;">ISO/IEC JTC 1/SC 32</p> <p style="text-align: center;">Data Management and Interchange</p> <p style="text-align: center;">Secretariat: United States of America (ANSI) Administered by Pacific Northwest National Laboratory on behalf of ANSI</p>

DOCUMENT TYPE	Other document (Open)
TITLE	ISO/IEC SC 32/WG 5 Remote Database Access Presentation
SOURCE	John Hadjioannou SC 32/WG 5
PROJECT NUMBER	
STATUS	Presentation for WG 5 at the Group Tutorial ISO/IEC JTC 1/SC 32 on 1999-05-21
REFERENCES	
ACTION ID.	FYI
REQUESTED ACTION	
DUE DATE	
Number of Pages	32
LANGUAGE USED	English
DISTRIBUTION	P & L Members SC Chair WG Conveners and Secretaries

Douglas Mann, Secretariat, ISO/IEC JTC 1/SC 32

Pacific Northwest National Laboratory *, 901 D Street, SW., Suite 900, Washington, DC, 20024-2115,
United States of America

Telephone: +1 703 575 2114; Facsimile: +1 703 681 9180; E-mail: MannD@battelle.org

*Pacific Northwest National Laboratory (PNL) administers the ISO/IEC JTC 1/SC 32 Secretariat on behalf of ANSI

SC32 Plenary and Tutorial
Matsue, Japan - May 1999

ISO/IEC JTC1 SC32 WG5
Remote Database Access

web: www.sc32wg5.freemove.co.uk

reflector: sc32wg5@minster.co.uk

convener: John Hadjioannou

Telephone: +44 1525 374667 *Fax:* +44 1525 850427

Email: john@minster.co.uk

WG5 Tutorial

Matsue, Japan - May 1999

- Scope and activities of WG5
- Remote Database Access
 - Purpose
 - Model
 - Technical Information
- Future Directions

WG5

Terms of Reference

- Standards to facilitate interworking of applications and databases that may be located on different sites.
- Principally communications and management data.
- Complementary to and dependent on standards for database languages.

Remote Database Access - RDA

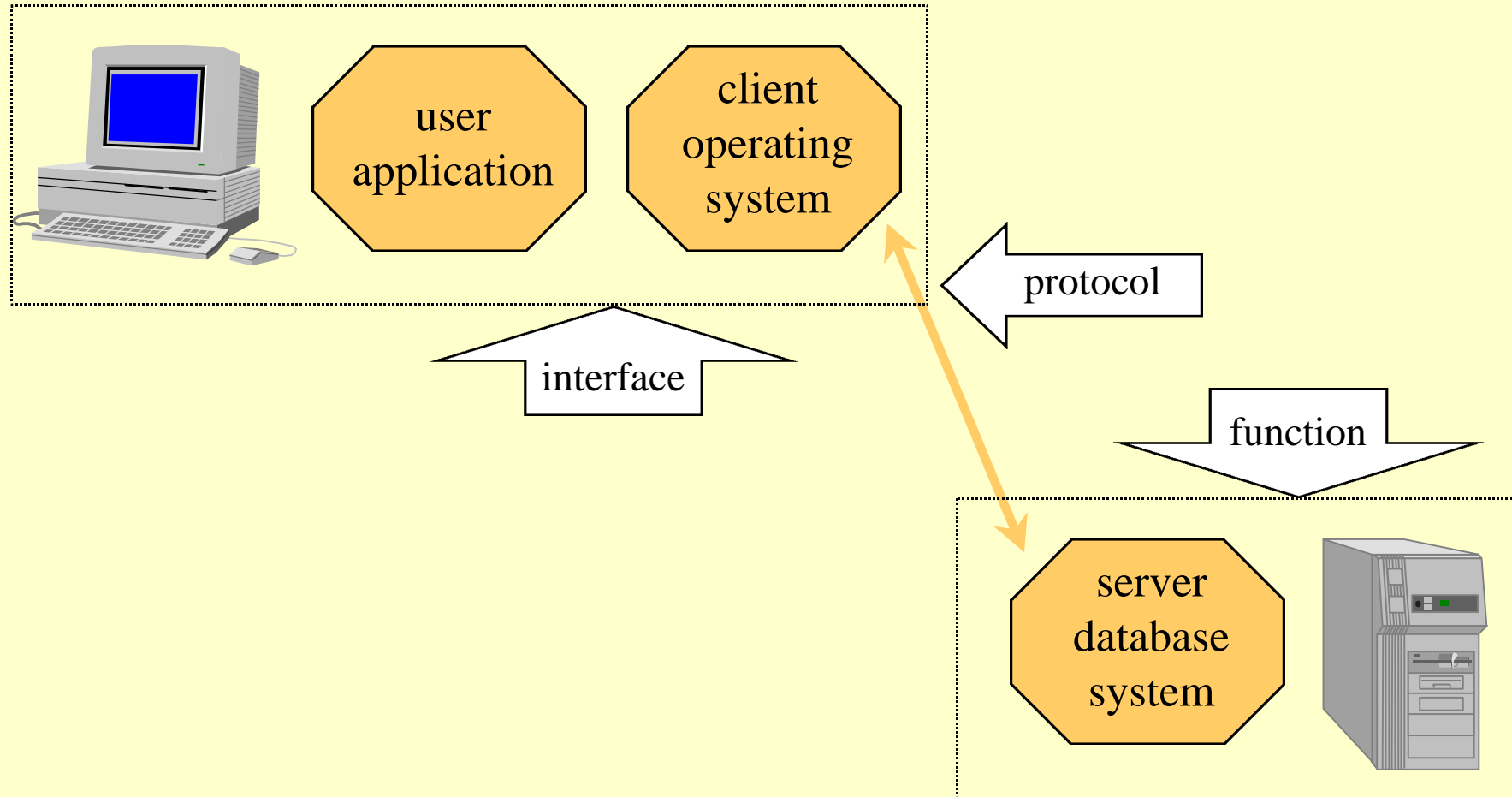
Purpose

- To allow, with the minimum of technical agreement outside the standard, the interconnection of applications and database systems
 - from different manufacturers
 - under different managements
 - of different levels of complexity
 - exploiting different technologies

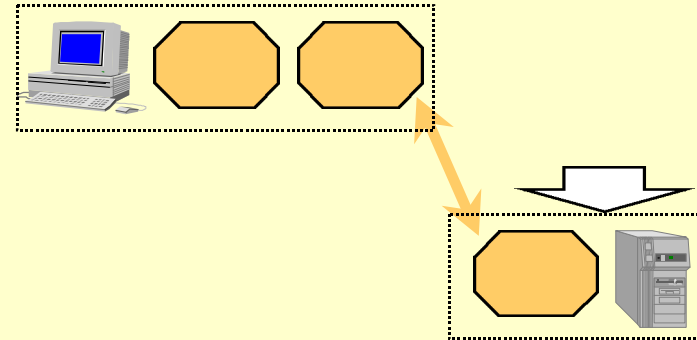
Why is RDA needed?

Doesn't SQL/CLI or ODBC
do the same thing?

Database Standards

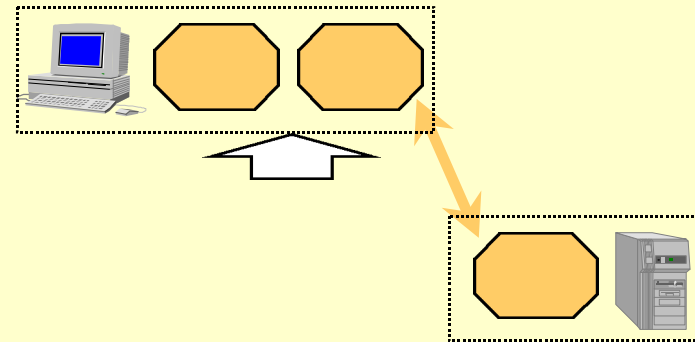


SQL Language



- ISO/IEC 9075
- Defines function of server
- Universally accepted database language
- Enables database system independence

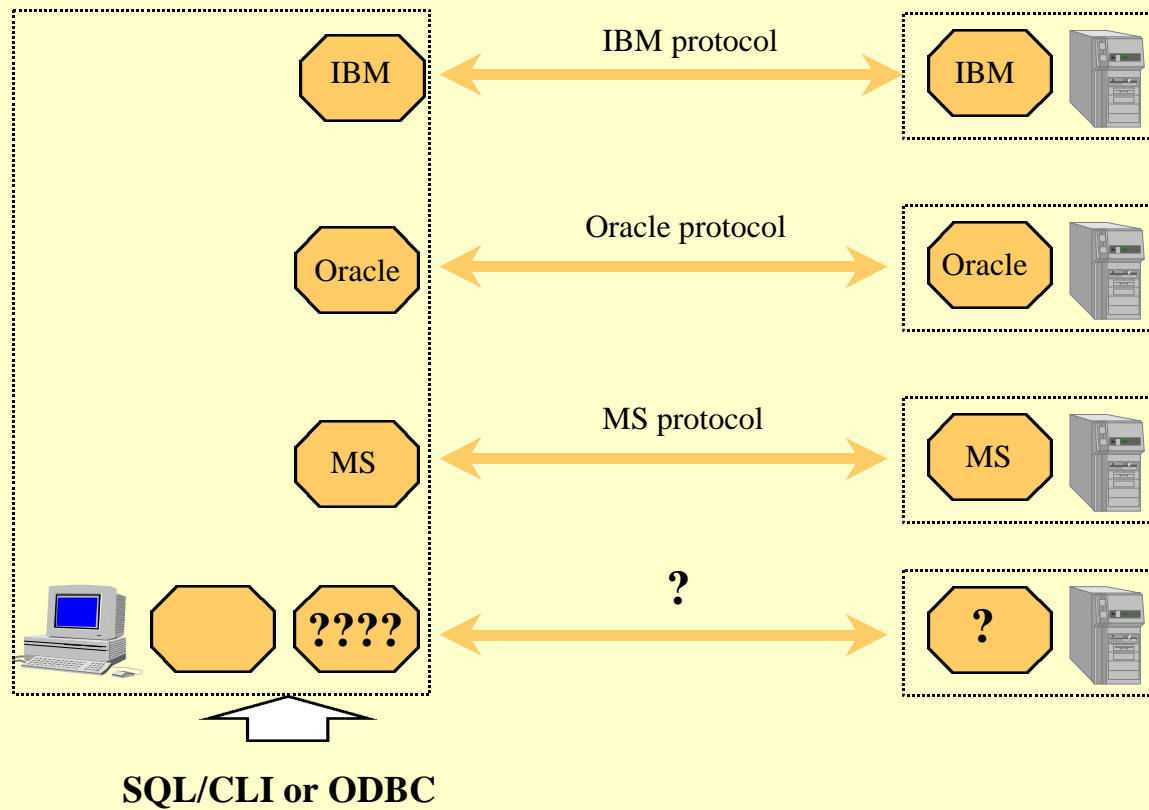
SQL/CLI



- ISO/IEC 9075-3
- Defines an interface between client application and client operating system
- Enables application portability

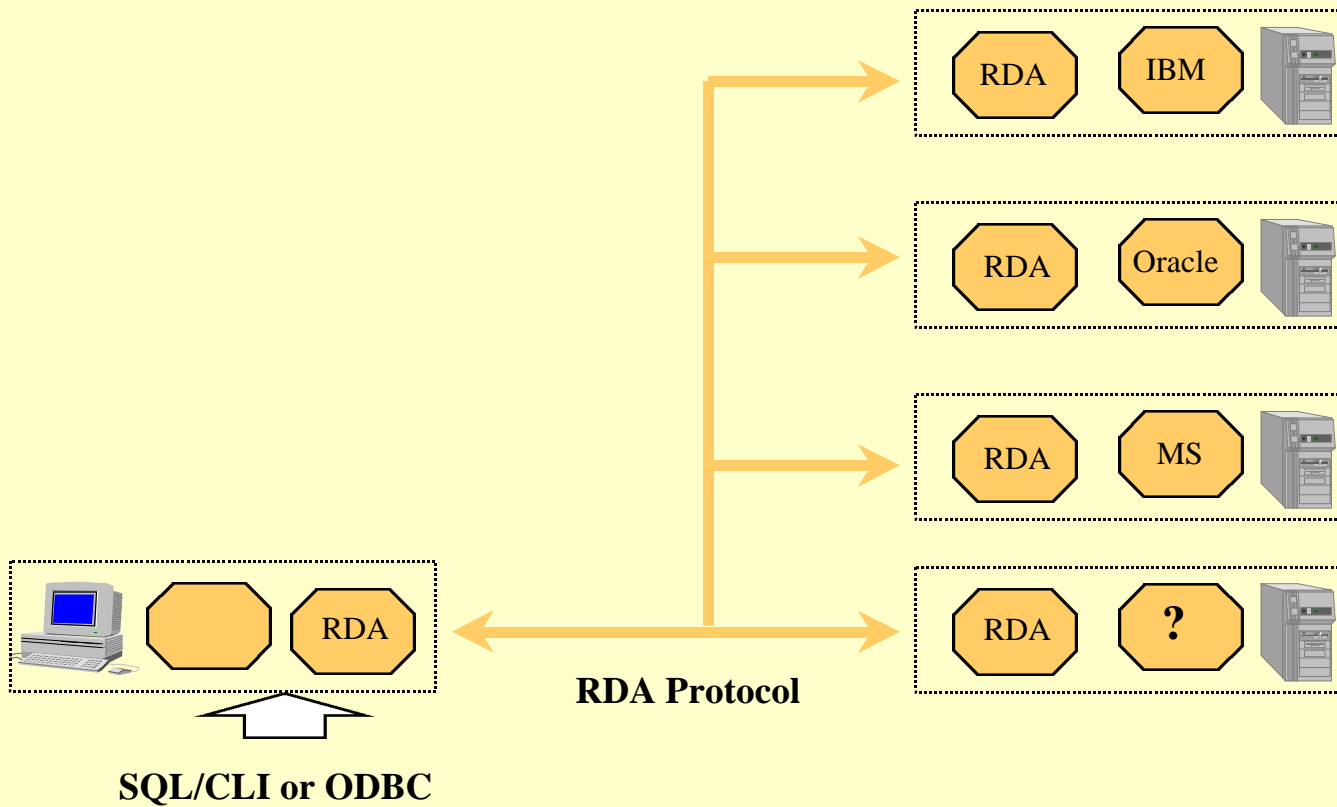
SQL/CLI

Practical Implementation

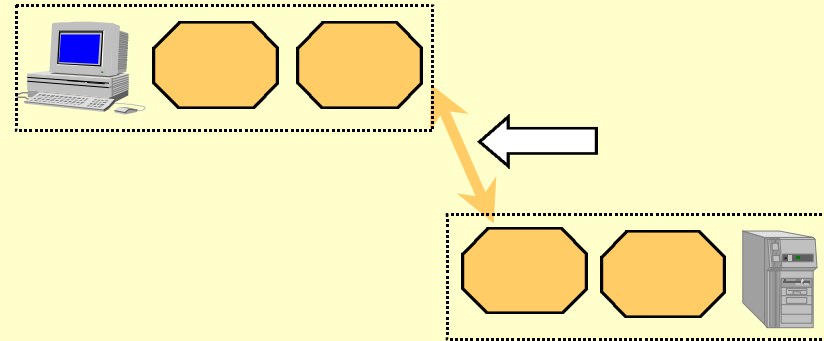


SQL/CLI

Where RDA fits in



RDA



- ISO/IEC 9579
- Defines client / server protocol
- Defines facilities to enable heterogeneous interworking

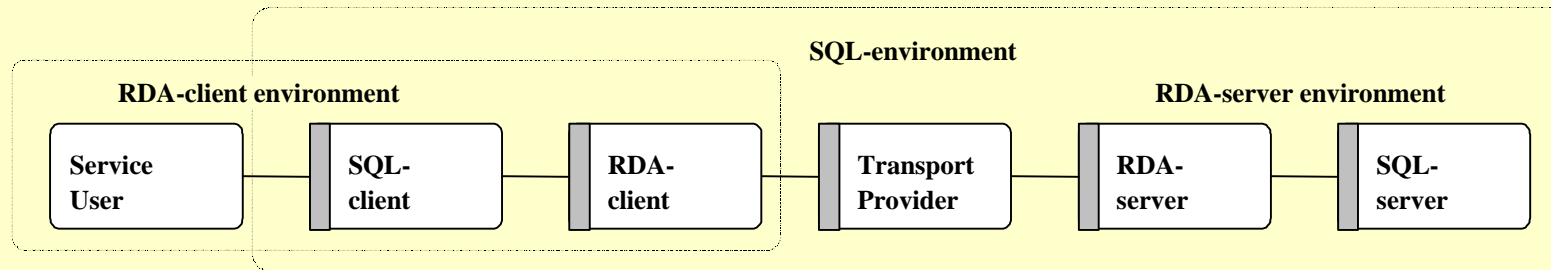
RDA Standards

- Obsolete
 - ISO/IEC 9579-1:1993 Generic
 - ISO/IEC 9579-2:1998 SQL Specialisation
 - ISO/IEC 9579-3:1996 PICS proforma
- ISO/IEC 9579:1999
Remote Database Access for SQL

RDA

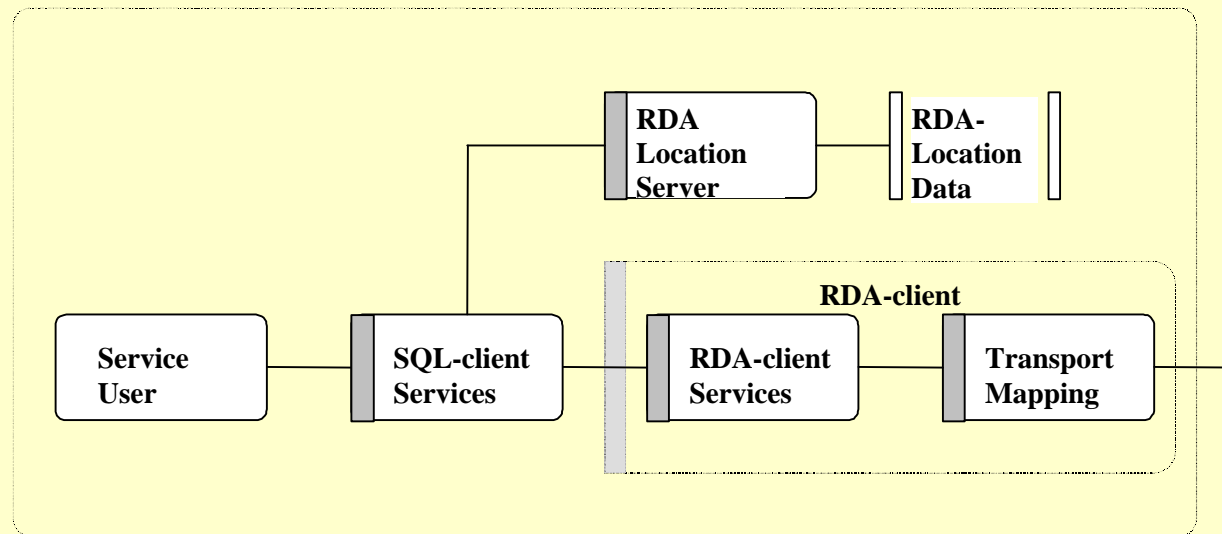
- Provides
 - Model
 - Protocol “on the wire”
 - Mapping to Transport
 - Operations at server
 - Mapping from SQL/CLI to protocol
 - Location Server
 - Support Server

RDA Model



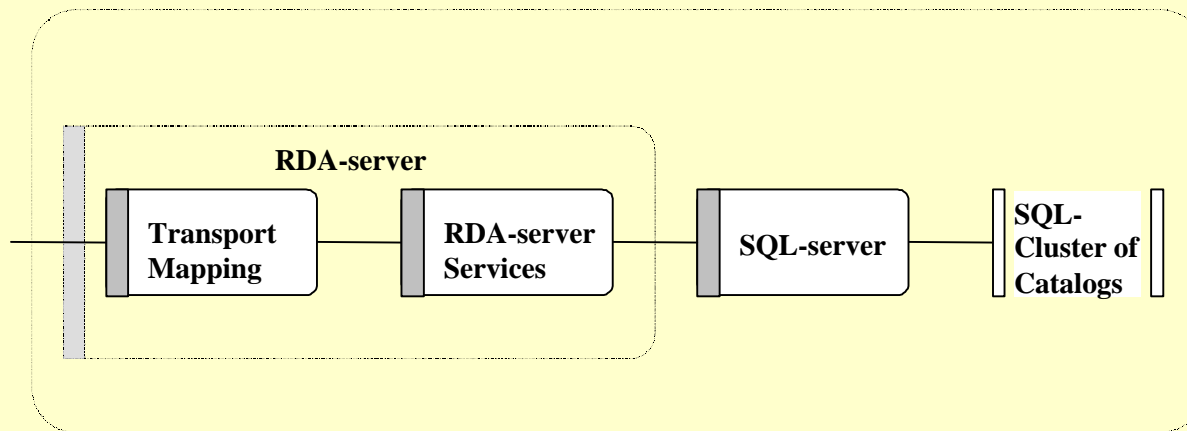
RDA Model

RDA-client environment



RDA Model

RDA-server environment



Mapping to Transport

- RDA defined as “Transport Independent”
- Mappings defined to:
 - TCP/IP
 - TLS 1.0
- Encodings
 - Fully defined “Basic Encoding”
 - Optional ASN.1 PER encoding

Protocol

- Lightweight protocol with little state
- One message format
- Confirmed protocol
- Request / Response
- Asynchronous
- Concatenated

Protocol *Message Envelope*

- RDAMessage

- Protocol *marker identifying RDA*
- Version *version identification*
- Encoding *encoding format*
- Length *length of message*
- ConnectionId *identifies SQL connection*
- RequestId *ties responses to requests*
- Type *message type*
- Context *global transaction context*
- Data *message payload*
- Authentication *optional authentication data*

Operations

RDAMessage type

- RDAConnect
- RDADisconnect
- RDAEndTran
- RDAClientAttribute
- RDAGetInfo
- RDASetCursorName
- RDAGetTypeInfo
- RDAStatementPrepare
- RDAStatementDeallocate
- RDAStatementExecute
- RDAStatementExecDirect
- RDAStatementFetchRows
- RDAStatementCloseCursor
- RDAStatementCancel
- Response

Mapping of SQL/CLI

- Defines location of activities
- Maps SQL/CLI functions to RDA operations

Mapping of SQL/CLI to RDA

SQL/CLI function	RDA Operations invoked
AllocConnect	No
AllocEnv	No
AllocHandle	No
AllocStmt	No
BindCol	No
BindParam	No
Cancel	RDASTatementCancel
CloseCursor	RDACloseCursor
ColAttribute	No
Connect	RDAConnect
CopyDesc	No
DataSources	No
DescribeCol	No
Disconnect	See C.1
EndTran	See C.2
Error	No
ExecDirect	RDASTatementExecDirect
Execute	RDASTatementExecute
Fetch	RDASTatementFetchRows
FetchScroll	RDASTatementFetchRows
FreeConnect	No
FreeEnv	No
FreeHandle	No
FreeStmt	RDASTatementDeallocate

SQL/CLI function	RDA Operations invoked
GetConnectAttr	No
GetCursorName	RDAGetCursorName
GetData	No
GetDescField	No
GetDescRec	No
GetDiagField	No
GetDiagRec	No
GetEnvAttr	No
GetFunctions	No
GetInfo	RDAGetInfo
GetStmtAttr	No
GetTypeInfo	RDAGetTypeInfo
NumResultCols	No
ParamData	No
Prepare	RDASTatementPrepare
PutData	No
RowCount	No
SetConnectAttr	See C.3
SetCursorName	RDASetCursorName
SetDescField	No
SetDescRec	No
SetEnvAttr	See C.3
SetStmtAttr	See C.3

RDA Location Server

Mapping information between

- local SQL-server name

and

- Transport type
- Transport address
- remote SQL-server name

RDA Support Server

- Provides management information
 - SQLGetInfo information
 - RDA activity log

RDA Developments

- Enhancements
 - Amendment 1: Secure RDA
 - Amendment 2: Distribution Schema for RDA
 - Amendment 3: Encompassing Transaction
- ISO/IEC 9579: 2000
Remote Database Access for SQL3

Security

- Addresses issues of
 - Authentication
 - Access Control
 - Transfer Integrity
 - Transfer Confidentiality
 - Non-repudiation

Security *Profiles*

- Four profiles defined using features of:
 - RDA
 - TCP/IP
 - TLS 1.0
 - X.509 Attribute Certificates
- Profiles trade off cost of management against aspects of security

Distribution Schema for RDA

- Revises RDA model
- Defines Distribution Schema
- Addresses issues:
 - heterogeneous interworking
 - performance
 - security, especially authentication

Encompassing Transactions

- Interacts with external Transaction Managers
- Support for *xa_* interface
- Propagates Global Context information

Next edition

- Combines
 - ISO/IEC 9579
 - Security amendment
- Adds support for all SQL3 operations
- FCD June, expect FDIS by end of year

Reference Platform

- Publicly available executables and source for RDA client and RDA server
- Client and server currently tested with
 - Windows 95, 98, NT3.51, NT4, NT5b2
 - ODBC 3.51, JDBC
 - MS SQL-server, IBM DB2 and others