Oracle® Rdb Data Provider for .NET

Release Notes
V7.3-21
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Oracle Rdb Data Provider for .NET Release Notes, V7.3-21

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Preface

This document is your primary source of release information for Oracle Rdb Data Provider for .NET.

Oracle Rdb Data Provider for .NET is an implementation of the Microsoft ADO.NET interface.

This preface contains these topics:
- Audience
- Organization
- Related Documentation
- Conventions

Audience

Oracle Rdb Data Provider for .NET Release Notes is intended for developers who are developing applications to access an Oracle Rdb database using Oracle Rdb Data Provider for .NET. This documentation is also valuable to systems analysts, project managers, and others interested in the development of database applications.

To use this document, you must be familiar with Microsoft .NET Framework classes and ADO.NET and have a working knowledge of application programming using Microsoft C#, Visual Basic, or C++.

Users should also be familiar with the use of Structured Query Language (SQL) to access information in relational database systems.

Organization

This document contains:

- **Chapter 1, "Installing and Configuring"**
Describes how to install Rdb Data Provider for .NET and provides system requirements.
Read this chapter *before* installing or using Rdb Data Provider for .NET.

- **Chapter 2, "Enhancements Provided in Oracle Rdb Data Provider for .NET Release 7.3-21"**
Describes new and changed features in Oracle Rdb Data Provider for .NET release 7.3-21.

- **Chapter 3, "Problems Corrected"**
Describes problems corrected in Oracle Rdb Data Provider for .NET release 7.3-21.

- **Chapter 4, "Known Problems, Restrictions and Workarounds"**
Describes known problems, restrictions, and workarounds for Oracle Rdb Data Provider for .NET release 7.3-21.

- **Chapter 5, "New Features and Corrections in Previous Releases"**
Describes new and changed features and problems corrected in previous versions of Oracle Rdb Data Provider for .NET.

Related Documentation

For more information, see these Rdb resources:
- *Oracle Rdb7 Guide to Database Design and Definition*
- *Oracle Rdb7 Guide to Database Performance and Tuning*
- *Oracle Rdb Introduction to SQL*
- *Oracle Rdb 7.2 SQL Reference Manual*
- *Oracle Rdb Guide to SQL Programming*
- *Oracle SQL/Services Server Configuration Guide*

- *Guide to Using the Oracle Rdb7 Oracle SQL/Services (tm) Client API*
- *Oracle Rdb JDBC Driver User's Guide*
- *Oracle Rdb Data Provider for .NET Developer's Guide*

To download free release notes, installation documentation, white papers, or other collateral, please visit the Rdb web site:

http://www.oracle.com/technetwork/database/rdb

For additional information, see:
http://msdn.microsoft.com/netframework

Conventions

Oracle Rdb Data Provider for .NET is often referred to as ORDP.NET or simply ORDP.

Hewlett-Packard Company is often referred to as HP.

The following conventions are used in this document:

word	A lowercase word in a format example indicates a syntax element that you supply.
[ ]	Brackets enclose optional clauses from which you can choose one or none.
{ }	Braces enclose clauses from which you must choose one alternative.
...	A horizontal ellipsis means you can repeat the previous item
. . .	A vertical ellipsis in an example means that information not directly related to the example has been omitted.

Conventions in Code Examples

Code examples illustrate SQL or other command-line statements. They are displayed in a monospace (fixed-width) font and separated from normal text as shown in this example:

```
SELECT last_name FROM employees WHERE last_name = 'TOLIVER';
```

Passwords in Code Examples

For simplicity in demonstrating this product, code examples do not perform the password management techniques that a deployed system normally uses.

In a production environment, please follow your corporate password management guidelines and other security recommendations.

Chapter 1
Installing and Configuring

This chapter describes installation and configuration requirements for Rdb Data Provider for .NET.

1.1 System Requirements

Oracle Rdb Data Provider for .NET requires the following products to be installed:

Software	Minimum Version
Microsoft .NET Framework	V2.0
Windows NT, Windows XP, Windows Vista, Windows 2000, Windows Server 2003, or Windows 7	As released

If SQL/Services will be used for server connectivity then the following software is required.

On the CLIENT:

Software	Minimum Version
Rdb SQL/Services Client	V7.3.0.1

Note:
> **The installation of ORDP.NET will install the minimum SQL/Services client software required for ORDP - SQL/Services connectivity from a Microsoft Windows environment, so a separate installation of SQL/Services Client software is not required. During installation a template version of `SQSAPI32.INI` will be copied to the ORDP.NET installation directory. This file may be modified to suit your SQL/Services environment as specified in the SQL/Services documentation. To change your SQL/Services setting this INI file must be copied to your system Windows directory. See your SQL/Services documentation for more information on `SQSAPI32.INI`.**

On the SERVER:

Software	Minimum Version	
	Alpha	**Integrity**
HP OpenVMS	V8.2	V8.2-1
Oracle SQL/Services	V7.3	V7.3
TCP/IP Services for OpenVMS	V5.5	V5.5-11
Oracle Rdb	V7.2	V7.2

If JDBC thin servers will be used for server connectivity then the following software is required.

On SERVER:

Software	Minimum Version	
	Alpha	Integrity
HP OpenVMS	V8.2	V8.2-1
Oracle JDBC for Rdb	V7.3	V7.3
HP Java ^{tm} SDK/RTE	V5.0-1 (1.5.0-1)	V5.0-1 (1.5.0-1)
Oracle Rdb	V7.2	V7.2

See Also:
- http://msdn.microsoft.com/netframework

1.2 De-install previous Oracle Rdb Data Provider for .NET versions.

If you have a previously installed version of ORDP.NET you must de-install this prior to installing V7.3-21 ORDP.NET.

If you installed ORDP.NET as part of V7.3-2 ORDT you should use the MSI file provided with that installation kit to de-install ORDT. If you no longer have this MSI file then you should use `Control Panel / Add or Remove Programs` to remove ORDT.

If the prior version of ORDP.NET was lower than V7.3-2 and you have changed your `machine.config` to add references to ORDP.NET then you should remove these changes prior to installing the new version of ORDP.NET.

In particular, if the following sections exist in your current machine.config, they should be removed:

```
<system.data>
   <DbProviderFactories>
     <add name="Oracle Rdb Data Provider"   . . .
```

and

```
<configuration>
  <configSections>
    <section name="oracle.dataaccess.rdbclient" . . .
```

1.3 Installing Oracle Rdb Data Provider for .NET

Starting with Release 7.3-2 of ORDP.NET, ORDP.NET is installed as part of Oracle Rdb Developer Tools for Visual Studio (ORDT).

If you do not require the Visual Studio integration features of ORDT then when you install ORDT you may select a customized installation and choose only to install ORDP.NET.

During the installation of ORDT the strongly named ORDP.NET assembly will be added to your system Global Assembly Cache so that a single assembly instance may be used by multiple applications.

Note:
> **Starting with Release 7.3-2 of ORDP.NET, ORDP.NET will no longer provide a standard assembly.**

The ORDT installation will also update your system `PATH` variable to include the ORDP.NET installation directory and will make the appropriate changes to your `machine.config` file so that ORDP.NET will be registered correctly for use with .NET applications.

The final step of the installation merges the ORDT Visual Studio extensions into your Visual Studio environment.

Note:

> The re-configuration of Visual Studio 2005, Visual Studio 2008 and Visual Studio 2010 that occurs at the end of the installation and de-installation may take some time to complete, as it must merge all the VSPackages present within the Visual Studio environment.

> Please do not interrupt the installation/de-installation during this process as it may leave your Visual Studio environment in an unstable state.

Please refer to the Installation section of the ORDT Release Notes for more information on ORDT and ORDP.NET installation. You should also refer to your Microsoft .NET documentation for information on strongly named assemblies and the Global Assembly Cache.
.

1.3.1 Assembly Version Changes in V7.3-21

Starting with ORDP.NET version 7.3-21, the ORDT installation procedure may install one or two versions of the ORDP.NET assembly file Oracle.DataAccess.Rdb.dll onto your system.

If your system has .NET Framework versions 4.0 or above installed, version 7.3.2.1 of the ORDP.NET assembly will be installed. If you system has .NET Framework version 2.0, 3.0 or 3.5 installed, version 7.3.2.0 of the ORDP.NET assembly will be installed.

If both version 4.0 and an earlier version of the .NET framework are installed then both versions of the ORDP.NET assembly will be installed.

Both version of the ORDP.NET assembly retain the same PublicKeyToken as previous versions of ORDP.NET.

References made to prior version ORDP.NET strongly names assemblies in your configuration and system registry files may need to be changed to reflect the new assembly information to ensure that applications on your system will use the new version of ORDP.NET from the System Assembly Cache.

> **NOTE:** The ORDT.NET installation procedure will automatically update the standard .NET `machine.config` file and Visual Studio registration files to reference the correct version of the ORDP.NET assembly.

> However there may be optional features within Visual Studio or third party products that may require changes to the referenced ORDP.NET assembly version in order to function properly. Please refer to your Visual Studio or third party product documentation for further details.

1.4 File Locations

The installation files will be placed in the directory chosen during the installation procedure. The default directory is:

> `<systemdisk>\Program Files\Oracle\`

The ORDP-specific installation files will be copied to the ORDP sub-directory under the installation directory which, by default, will be:

> `<systemdisk>\Program Files\Oracle\ORDP`

Documentation files will be copied to the ORDT\docs sub-directory within the installation directory which, by default, will be:

> `<systemdisk>\Program Files\Oracle\ORDT\docs\`

The following assembly, library and documentation files will be copied to the appropriate installation sub-directories:

File	Description
ORDP_dev_guide_<version>.pdf	ORDP Developer Guide
ORDP_rel_notes_<version>.pdf ORDP_rel_notes_<version>.txt	ORDP Release Notes
Oracle.DataAccess.Rdb.dll	The ORDP assembly
rdbnet.dll	Required library for Rdb access
sql_cosi.dll	Required library for internal Rdbnet operations
sqsapi32.dll	Required library for SQL/Services access

File	Description
sqsapi32.ini	Configuration template file for use with SQL/Services

.

In addition, copies of one or both versions of the ORDP.NET assembly will be added to your Global Assembly Cache.

1.5 Post Installation Procedures

Starting with version 7.3-2, the ORDT installation will update your system PATH variable to include the ORDP.NET installation directory, so this no longer has to be done as a post-installation step.

The ORDT installation will also update your `machine.config` file to register ORDP.NET correctly for use with Visual Studio and other .NET applications.

However there are still some manual post-installation steps that have to be carried out.

If specific SQL/Services configuration settings are required, the template SQSAPI32.INI file provided with the ORDP.NET kit must be modified to reflect the required settings and moved to your system windows directory. See your SQL/Services documentation for more information.

The actual post-installation steps you will have to carry out will depend on how the DLL files will be used and may require changes to your development environment to either include this new directory path or to move the provided DLL files to the appropriate third-party directory.

Please refer to the documentation provided with your development software to determine what steps may be involved in order to use the Oracle Rdb Data Provider for .NET classes and libraries.

Chapter 2
Enhancements Provided in Oracle Rdb Data Provider for .NET Release 7.3-21

This chapter describes new and changed features in Oracle Rdb Data Provider for .NET release 7.3-21.

2.1 Oracle Rdb Entity Framework Provider.

Additional classes and templates have been added to ORDP to allow ORDP to carry out the appropriate operations required of an Entity Framework Provider within .NET framework 3.5 and .NET 4.0.

Please refer to your .NET framework documentation for information on Entity Framework.

Also please refer to your ORDT documentation for information on the Oracle Rdb Entity Framework provider and examples on how to use the provider.

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Chapter 3
Problems Corrected

This chapter describes problems corrected in Oracle Rdb Data Provider for .NET release 7.3-21.

3.1 PopulateReservedWords problem on Pooled connection

The following exception may be raised when using POOLEDTHIN or POOLEDSQS type connections:

```
"Index was outside the bounds of the array."
at
Oracle.DataAccess.RdbClient.Common.ConnectionSchema.PopulateReserv
edWords(String collectionName, String normalizedDBVersion)\r\n
```

This problem has been fixed.

3.2 Domains collection Remarks and Default Value Columns not converted

The `Remarks` column of the Rdb specific Collection **Domains** was not correctly converted to `String` on retrieval of the column description segmented string.

This problem has been fixed.

3.3 Retrieval of scaled BIGINT values incorrect

A problem in the conversion of scaled BIGINT values returned by the SQL/Services interface to ORDP may cause incorrect values to be returned to DECIMAL variables.

In some circumstances the following error is raised during data retrieval:

```
Error: Input string was not in a correct format.
```

This problem is only seen when using SQL/Services connectivity.
A possible workaround is to use JDBC thin connectivity.

This problem has now been fixed.

3.4 Insert or Update of Scaled BIGINT problem

During an insert or update operation on a scaled BigInt column, any digits after the decimal point are incorrectly stripped from the value, resulting in an incorrect value being saved into the database.

The following code fragment shows an example of an operation that will show this problem:

```
// C#
// create table in db with
// "create table bigint_trunc1 (c1 bigint(4));"

RdbCommand cmd = new RdbCommand(
      "Insert into bigint_trunc1(c1) values (@d_value)", conn);
RdbParameter prmDecimal = cmd.Parameters.Add(
       new RdbParameter("@d_value", System.Data.DbType.Decimal));
prmDecimal.Value = 1.234;
cmd.ExecuteNonQuery();
```

Inspection of the value within the database will show that the value stored will be "1.0000" and not "1.2340".

This problem is only seen when using SQL/Services connectivity.
A possible workaround is to use JDBC thin connectivity.

This problem has now been fixed.

3.5 RdbDataReader.GetSchemaTable() problem

Several properties returned by the GetSchemaTable() method of the RdbDataReader class may show wrong information.

The following properties may return incorrect return values:

- "isExpression"
- "isReadOnly"
- "isAutoIncrement"

This problem has now been fixed.

Note:

If you are using SQL/Services connectivity this fix will be immediately available after the installation of V7.3-21 of ORDT.

If you are using JDBC thin connectivity, the fix also requires appropriate changes in the JDBC servers. In order for this fix to work while using JDBC thin connectivity, the connected servers must be running version V7.3-02 or greater of Oracle JDBC for Rdb.

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Chapter 4
Known Problems, Restrictions and Workarounds

This chapter describes known problems, restrictions, and workarounds for Oracle Rdb Data Provider for .NET release 7.3-21.

4.1 Distributed transaction support not available in this version.

The use of distributed transactions is not currently supported in ORDP. This feature will be available in a future release of this product.

4.2 Using FetchSize with Nested Queries and SQL/Services type RdbConnection.

When SQL/Services is used to provide RdbConnection connectivity, the use of FetchSize with a value other than one (1) may cause problems if nested queries are involved.

For example the following code showing a nested query may fail if the FetchSize for the connection or command is anything other than 1.

```
// C#
.
.
.
RdbCommand employees = conn.CreateCommand();
employees.CommandText =
@"select employee_id,first_name,last_name from
      employees limit to 5 rows";
RdbDataReader employee = employees.ExecuteReader();

while (employee.Read())
{
    String id = employee.GetString(0);
    RdbCommand degrees = conn.CreateCommand();
    degrees.CommandText =
@"select degree,degree_field from degrees where
      employee_id='" + id + "'";
    RdbDataReader degree = degrees.ExecuteReader();
    while (degree.Read())
    {
        String type = degree.GetString(0);
        String field = degree.GetString(1);
        Log("Degree:" + type + " " + field);
    }
    degree.Close();
}
employee.Close();
```

```
.
.
.
```

The problem here is that when the FetchSize is greater than 1 an optimization called FETCH_MANY is used in the SQL/Services connection to allow multiple records to be sent from the server to the client in a single network IO.

SQL/Services does not allow any other fetch operation to be done on this same connection until all the records returned by the FETCH_MANY have been read by the application. This means that's loops such as shown above cannot be done while FETCH_MANY is in operation as the code will try to do a fetch of the inner reader before getting all the records from the FETCH_MANY on the outer loop.

If fetch of another record set is attempted while FETCH_MANY is active the following exception is raised by SQS/Services:

> **`batched sqlsrv_execute or sqlsrv_fetch_many context is active.`**

To work-around this limitation, FetchSize should be set to 1 for queries where nesting will be done.

For example:

```csharp
// C#
.
.
.
RdbCommand employees = conn.CreateCommand();
employees.FetchSize = 1;
employees.CommandText =
@"select employee_id,first_name,last_name from
      employees limit to 5 rows";
RdbDataReader employee = employees.ExecuteReader();
while (employee.Read())
.
.
.
```

4.3 Using FetchSize with Blobs and SQL/Services type RdbConnection.

For the same reason as described in the previous section, queries containing Blob columns should also be carried out using FetchSize = 1.

Oracle Rdb requires the use of a separate query to obtain the contents of a Blob (List of Byte Varying) columns.   This retrieval query is setup and executed internally when the contents of a Blob column are retrieved.

As this may involve a nesting of queries, the FetchSize must be set to 1 otherwise an exception as shown in the previous section will be raised.

The following is an example of coding the retrieval of Blob information.

```csharp
// C#
.
.
```

```
.
// Get  LATIN1 encoding as it's the closest to DEC_MCS

Encoding Latin1 = Encoding.GetEncoding("ISO-8859-1");

RdbCommand cmd = new RdbCommand(
@"SELECT employee_id, resume FROM resumes WHERE employee_id = '00164'",
   db);
cmd.CommandType = CommandType.Text;
cmd.Connection.Open();
cmd.FetchSize = 1;

RdbDataReader reader = cmd.ExecuteReader();
while (reader.Read())
{
            string id = reader.GetValue(0).ToString();
        int length = (int)reader.GetBytes(1, 0, null, 0, Int32.MaxValue);
        byte[] resume = new byte[length];
        reader.GetBytes(1, 0, resume, 0, length);
        Console.WriteLine("resume for id = "+id);
        Console.WriteLine(Latin1.GetString(resume));
}
.
.
.
```

4.4 SQL/Services Transaction Reusable Database Services are not Supported

ORDP.NET does not support SQL/Services connections using executors that have transaction reusable database services enabled.

4.5   Rdb V7.3 Datatype Changes

Rdb V7.3 has made some changes to the datatypes used by some of the standard functions such as Count(), which will now be returned to applications as a 64 bit value.

This change may cause some problems with existing applications written using ORDP as the object type returned by some operations will change to reflect the new datatypes returned by Rdb.

In particular, care should be taken when using ORDP methods that return objects as their return values, as implicit casting may no longer be valid.

For example:

```
// C#

RdbCommand CmdObj = new RdbCommand("", conn);
```

```
CmdObj.CommandText = "select count(*) from employees";

int count = (int)CmdObj.ExecuteScalar();
```

This code will work fine with V7.2 Rdb and below but will throw the following exception when accessing a V7.3 Rdb database using V7.3 SQS/Services:

System.InvalidCastException: Specified cast is not valid.

The reason for the exception has to do with implicit boxing and unboxing of objects carried out by C#.

When accessing Rdb databases using versions prior to Rdb 7.3 the execution of the above `ExecuteScalar` method would return an `int (or System.Int32)` boxed object. This object may be cast to an int as C# will implicitly unbox the object as `Int32` first prior to casting.

Using Rdb V7.3, the object returned by ExecuteScalar method in the example shown above will now be a `long (or System.Int64)`. Implicit boxing requires that the object be unboxed to exactly the same type as it was boxed, however the cast to `int` in the expression will try to unbox the object as `Int32` which is not allowed and thus an exception is raised.

The application must use the appropriate datatyped variable if using implicit unboxing, for example:

```
//C#

long count = (long)CmdObj.ExecuteScalar();
```

Or should explicitly unbox the object correctly prior to casting:

```
//C#

int count = (int)(long)CmdObj.ExecuteScalar();
```

Chapter 5
New Features and Corrections in Previous Releases

5.1 New Features for Release 7.3.2

This section describes new and changed features in the Oracle Rdb Data Provider for .NET release 7.3-2.

5.1.1 Integration of Oracle Rdb Data Provider for .NET into Microsoft Visual Studio.

Oracle Rdb Data Provider for .NET is now integrated into the Microsoft Visual Studio for .NET IDE.

Please refer to the Oracle Rdb Developer Tools for Visual Studio Developer's Guide and the information on the Oracle Rdb web site for more details.

http://www.oracle.com/technetwork/database/rdb

5.2 Corrections in Release 7.3.2

This section describes software errors corrected in the Oracle Rdb Data Provider for .NET release 7.3-2.

5.2.1 CallBackOnCollectedDelegate Problem

Bug 9304303.

ORDP.NET uses callbacks into .NET-managed code to handle things like raising exceptions.

The ORDP.NET code tries to maintain correct delegate references to these callback routines in a manner that prevents the .NET garbage collector from harvesting them, thus allowing them to be available for the duration of the callback to managed code.

Unfortunately a problem in how the delegates were set up when multiple concurrent connections are made from the same application, left the delegate methods vulnerable for garbage collection.

The problem may raise an exception similar to the following:

```
CallBackOnCollectedDelegate was detected
Oracle_DataAccess_Rdb!Oracle_DataAccess_RdbClient_Common_SQS+exceptionCallback
:Invoke
```

Depending on the amount of memory used and exactly when the garbage collector runs, it is possible that the delegates may be removed during the call into the underlying Rdb system, and if one of these callback delegates happens to be required, for example if an exception is raised, then this problem may occur.

In general the following conditions have to be met before this type of exception may be raised:

- The .NET application must open multiple concurrent connections
- Memory used within the application and underlying ORDP.NET methods must be high enough to cause the .NET garbage collector to be invoked.
- An Exception is raised during an operation within a concurrent connection stream that was open prior to the last connection stream created.

This problem has been fixed.

5.3 New Features for Release 7.3.1.1

This section describes new and changed features in the Oracle Rdb Data Provider for .NET release 7.3-11.

5.3.1 Additional DbType Support in RdbParameters

The following DbType datatypes were supported for RdbParameter datatypes in Oracle Rdb Data Provider for .NET release 7.3-10 and prior:

- `DbType.String`
- `DbType.SByte`
- `DbType.Int16`
- `DbType.Byte`
- `DbType.Int32`
- `DbType.UInt16`
- `DbType.Int64`
- `DbType.UInt32`
- `DbType.UInt64`
- `DbType.Time`
- `DbType.Date`
- `DbType.DateTime`
- `DbType.Single`
- `DbType.Double`
- `DbType.Decimal`
- `DbType.Binary`

The following additional DbTypes are now supported in V7.3-10:

- `DbType.AnsiString`
- `DbType.AnsiStringFixedLength`
- `DbType.StringFixedLength`

5.4 Corrections in Release 7.3.1.1

This section describes software errors corrected in the Oracle Rdb Data Provider for .NET release 7.3-11.

5.4.1 Unsupported DbType in RdbParameter Silently Ignored

Setting the DbType value of an RdbParameter to datatype not supported by Oracle Rdb Data Provider for .NET was silently ignored.

During the processing of the RdbParameter by Prepared Statements, data values for RdbParameters with unsupported DbType would not be recognized as being set and will raise an error similar to the following when the statement is executed:

```
Oracle.DataAccess.RdbClient.RdbException: Missing IN or OUT
parameter at index:  1 at
Oracle.DataAccess.RdbClient.Common.PreparedStatement.Execute() in
. . .
```

At the time the RdbParameter is created, ORDP will now raise the following exception if the DbType specified for the RdbParameter is unsupported:

```
  Oracle.DataAccess.RdbClient.RdbException: Unsupported DbType
```

Fixed
build 20090626.

5.4.2 Cast problem with tiny int.

Retrieving a tiny int column value from a table may raise the following exception:

```
Specified cast is not valid.  @rdb.Client.GetByteVal
```

A work around is to cast the column to another appropriate SQL datatype in your SQL statement

For example

```
Select cast (tinycolumn as integer) from table1;
```

This has now been fixed.

Fixed
build 20090626.

5.4.3 Possible memory leak when updating Blob columns

During the processing of update statements containing references to Blobs (list of byte varying) columns, ORDP incorrectly compiles the statement twice.

Only the second statement handle is released when the statement is closed which will lead to Rdb statement handles still being active within the current connection.

These active handles use memory and resources within ORDP and the Rdb system which may eventually lead to problems due to insufficient resources in long running connections.

In addition these compiled queries may prevent metadata operations from occurring on the affected tables within the current connection.

This has now been fixed.

Fixed
build 20090922.

5.4.4 Statement Handles not Released.

A problem in the ORDP driver code prevents some statement handles from being released correctly.

This problem is only found when the associated SQL statement is other than a SELECT statement, for example, INSERT or UPDATE statements

During the rundown of the RdbCommand object, the Dispose() method failed to close the associated statements and thus did not release the Rdb handles for those statements.

This accumulation of statement handles over time within connections that are open for lengthy periods may cause memory problems.

This problem has now been fixed and the RdbCommand.Dispose() method now correctly releases the underlying statement handles.

Note:
Oracle recommends that to help reduce unnecessary overhead, especially when dealing with statements that access Blob data, that any RdbCommand that has SQL text containing operations other than a SELECT should be explicitly disposed as soon as they are no longer used, by calling the RdbCommand.Dispose() method.

If the RdbCommand is not explicitly disposed of, it will be eventually garbage collected that will carry out an implicit dispose of the object. But until the object is disposed, underlying ORDP, SQL and Rdb resources will be held and not released and may have an accumulative resource depletion effect within the underlying database system and any associated Thin Server or SQL/Services service.

5.4.5 Retrieving Blob data from Column with Associate Variables

A problem in the ORDP driver code prevents the retrieval of Blob data when associate variables are used in conjunction with the list of byte varying column name in the SQL text.
For example the following SQL text will raise an exception during query compilation

```
// C#

RdbCommand CmdObj = new RdbCommand("", conn);

CmdObj.CommandText = "select resume RES from resumes";

byte[] resume = (byte[])cmd.ExecuteScalar();
```

This code will raise the following exception:

%**SQL-F-FLDNOTCRS, Column RES was not found in the tables in current scope**

The associate variable RES hides the actual source column name from ORDP.

ORDP incorrectly uses the associate variable name when building the underlying SQL statements used to retrieve the Blob data from the database.

A work-around for this problem is to not use associate variables on list of byte varying columns.

This has now been fixed.

Fixed

build 20090925

5.4.6 Fraction of Seconds trimmed from VMS DATE

During retrieval of data from the Rdb database, the ORDP code handling the conversion of DATE VMS data to the appropriate .NET datatype inadvertently trimmed off the fraction of seconds value.

This problem only occurs with SQS connections and where the Rdb datatype of the source column or variable is DATE VMS.

This has now been fixed.

Fixed

build 20091003

5.4.7 Delimited Identifiers not handled correctly

Using delimited identifiers for column or table names in SQL text may cause problems with the parsing of the statement by the ORDP drivers.

An error in how double quotation characters are parsed within the SQS text prevents ORDP from correctly handling delimited identifiers, for example the following code snippet:

```
// C#
.
.
.
DataSet ds = new DataSet();
string selectString = @"select ""JOB_CODE"" from JOBS";
RdbDataAdapter adapter = new RdbDataAdapter(
  selectString, conn);
adapter.Fill(ds);
.
.
.
```

may raise the following exception:

```
Oracle.DataAccess.RdbClient.RdbException occurred
Message="Unhandled exception@Statement.Execute :
Index was out of range. Must be non-negative and less than the
size of the collection"
```

This has now been fixed.

Fixed

build 20091201

5.5 New Features for Release 7.3.1.0

This section describes new and changed features in the Oracle Rdb Data Provider for .NET release 7.3-10.

5.5.1 Pooled Connections

Two new types of connections are now available:
- POOLEDSQS
- POOLEDTHIN

These new connection types are Pooled Connection variants of the SQS and THIN connection types that allow simple connection pooling. Their behavior is basically the same as the underlying basic connection type except that during connection open the connection will be taken from a pool of established connections and on close will be returned to the pool of connections again.

The connection pools established are application instance local, that is, the pools of connections are only available to the current application instance and its associated threads. Separately running application instances will have their own pools of connections that are not sharable across instances.

This type of pooling was primarily created to help reduce the connection overhead in those applications that may be constantly connecting and disconnecting from the underlying data source, and may be using separate threads to carry out discrete operations on the same data source.

RdbConnection has new methods that allow the setup and maintenance of these connections pools.

Please refer to the *Oracle Rdb Data Provider for .NET Developer's Guide* for information on the use of connection pools.

5.5.2 External Procedure support

Rdb External Procedures can now be used within ORDP in a similar manner to *StoredProcedures*.

RdbCommand has been enhanced to allow the specification of a new command type called ***RdbCommandTypes.ExternalProcedure***, allowing Rdb external procedures to be invoked directly using the procedure name as the sole contents of the *RdbCommand* CommandText. For example:

```
// C#
RdbCommand cmd = cn.CreateCommand();
cmd.RdbCommandType =
   RdbCommandTypes.ExternalProcedure;
cmd.CommandText = "MY_EXTERNAL_PROCEDURE";
RdbCommandBuilder.DeriveParameters(cmd);
RdbParameterCollection col1 = cmd.Parameters;
```

Please refer to the *Oracle Rdb Data Provider for .NET Developer's Guide* for information on the use of External Procedures.

5.5.3 GetSchema Collections Support

The RdbConnection.GetSchema() method may now be used to retrieve information about connected databases.

The following Collections are now supported:

- MetaDataCollections
- DataSourceInformation
- DataTypes
- Restrictions
- ReservedWords
- Tables

- Columns
- Views
- Synonyms
- Sequences
- Functions
- Procedures
- ProcedureParameters
- Indexes
- IndexColumns
- PrimaryKeys
- PrimaryKeyColumns
- ForeignKeys
- ForeignKeyColumns
- UniqueKeys
- UniqueKeyColumns
- Domains
- Outlines
- Constraints

Please refer to the *Oracle Rdb Data Provider for .NET Developer's Guide* for information on Supported Collections.

See Also:
"Understanding the Common Schema Collections" in the MSDN Library

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5.6 Corrections in Release 7.3.1.0

This section describes software errors corrected in the Oracle Rdb Data Provider for .NET release 7.3-10.

5.6.1 RdbFactory Documentation Omission

RdbFactory was introduced in the ORDP release 7.3-01 but information about enabling the use of the RdbFactory code within .NET was omitted from the release notes for ORDP release 7.3-01.

Before you can use RdbFactory it must be registered as a Data Provider Factory in your .NET machine.config file.

The machine.config file contains settings that apply to the entire computer.
There is only one machine.config file on a computer and may be found in the "CONFIG" subfolder of your .NET Framework install directory, for example on Windows 2000 the directory would be:

```
{System Disk}:\WINNT\Microsoft.NET\Framework\{Version Number}\CONFIG
```

If you wish to use the RdbFactory facility in conjunction with ORDP V7.3-01 then the following must be added to your .NET machine.config file:

```
<system.data>
     <DbProviderFactories>
.

.

.
<add name="Oracle Rdb Data Provider"
invariant="Oracle.DataAccess.RdbClient"
description=".Net Framework Data Provider for Oracle Rdb"
type="Oracle.DataAccess.RdbClient.RdbFactory,
Oracle.DataAccess.Rdb,Version=7.3.0.0,
Culture=neutral,PublicKeyToken=3a9ba85e401d6be5" />
.

.

.
```

Note that this is applicable only if you wish to use ORDP V7.3-01, to use ORDP V7.3-10   see
[Assembly Version Change for V7.3-10](#)

5.6.2 RdbConnection.IsOpen() method may Return Incorrect State Information

The IsOpen() method of RdbConnection was incorrectly determining the state of the connection by testing if the current state of the connection was *ConnectState.Open*. However as there could be other states that also imply that the connection is open, this method may return the value *false* even when the connection is currently open and active.

Fixed
> build 20080408.

5.6.3 RdbConnection Connection State not set Correctly when Connection Lost

If during an active connection the connection to the underlying data source server becomes unavailable, the state of the `RdbConnection` object was not being set appropriately and would show *ConnectionState.Open* even when the connection was known to be lost.

On lost connections, the RdbConnection state is now correctly set to *ConnectionState.Broken*.

Fixed
> build 20080411.

5.6.4 RdbParameterCollection Methods Incorrectly try to Cast the Value Object to RdbParameter type

A problem in the handling of the *val* parameter passed to the following methods method may cause ORDP to raise an *System.InvalidCastException:*

- `RdbParameterCollection.Add(Object val)`
- `RdbParameterCollection.Contains(Object val)`

The *va*l parameter to these methods should have been handled as an `RdbParameter` Value object rather than an `RdbParameter` object.

A word-around for this problem for the `Add()` method is to use the named parameter method instead:

```
RdbParameterCollection.Add(String paramName, Object value)
```

Fixed
> build 20080411.

5.6.5 Incorrect Error Message Returned when Error Code is Unknown

When an `RdbException` is raised with an unknown internal error code the following message should be set in the `RdbException` and returned by `RdbException.GetMessage()` method:

> *Unknown error code : NNNNNN*

Instead the following message was returned:

> *Non supported SQL92 token at position NNNNNN*

Fixed
> build 20080421.

5.6.6 Output Parameter Values on Stored Procedures Not Set

After execution of an `RdbCommand` of type `CommandType.StoredProcedure` the *Value* objects of output parameters were not being set, leaving the *Value* objects as null objects.

For example:

```
// C#
RdbCommand = new RdbCommand("MY_STORED_PROC", conn);
cmd.CommandType = CommandType.StoredProcedure;

RdbParameter p1 = new RdbParameter();
p1.ParameterName = "out1";
p1.DbType = DbType.Int32;
p1.Direction = ParameterDirection.Output;
cmd.Parameters.Add(p1);

int result = cmd.ExecuteNonQuery();
System.out.println( "result = " + p1.Value.ToString());
```

The query as show above would raise the following exception when trying to execute the last line:

System.NullReferenceException:
Object reference not set to an instance of an object.

Fixed

build 20080429.

5.6.7 Explicit Transactions using SQL/Services Connectivity Fail to Disable AUTOCOMMIT of Statements

When explicit transactions are enabled by using `RdbConnection.BeginTransaction` or by using a mechanism such as enlistment, the default behavior of ORDP to AUTOCOMMIT updateable SQL statements should automatically be disabled.

A problem in the ORDP code specific to RdbConnections using SQL/Services prevented this AUTOCOMMIT from being disabled.

Thus transaction may be found to be committed prematurely due to this AUTOCOMMIT action.

Fixed

build 20080429.

5.6.8 Incorrect Nested Query Exception Raised

When an `Exception` is raised during the execution of a `RdbConnection.ExecuteRead()` or `RdbConnection ExecuteScalar()` the underlying `RdbDataReader` object does not get correctly removed from the `RdbConnection`'s list of active readers which may cause the following `RdbException` to be incorrectly raised on subsequent calls to

RdbConnection.ExecuteRead() or RdbConnection ExecuteScalar() on the same RdbConnection:

An open RdbDataReader has FetchSize greater than 1, query nesting is not allowed in this case

A workaround for this problem is to close and re-open the connection after the primary exception is raised, or set the current RdbConnection fetch size to 1.

Fixed

build 20080527.

5.6.9 StateChangeEvent Not Raised when RdbConnection is Closed.

Whenever the RdbConnection *ConnectionState* changes all handlers registered as RdbStateChangeEventHandlers should be notified of the change of connection state.

During the close of the RdbConnection the connection state is correctly set to *ConnectionState.Closed*. However, a problem event notification during the close of the RdbConnection prevents the *ConnectionState.Closed* event from being sent to the event handlers.

Fixed

build 20080527.

5.6.10 Un-named Parameters Names may Clash with User Defined Parameter Names.

During the parsing of a SQL statement all parameter found in the statement are recorded to allow for the correct assignment of parameters declared in the Parameter List by the caller. If a simple parameter marker is used in the SQL text (i.e. "?") this "un-named" parameter is given a name internally to allow for correct positional alignment of the parameter. The following naming convention for these "un-named" parameters is used:

PARAMETER<position index>

However, the name generated is too likely to clash with user provided names for parameters in the statement, and if this happens, incorrect assignments of parameters or incorrect parameter lookup inside the ORDP engine may occur.

For example, due to the use of the same naming format for user defined parameter names and internal parameter name execution of the following SQL text:

```
SELECT last_name INTO ? FROM employees WHERE
  employee_id = @PARAMETER1 AND first_name = @PARAMETER2"
```

may cause the following exception to be raised.

RdbCommand cannot find parameter with name 'PARAMETER3'

In an attempt to minimize this problem the naming of "un-named" parameters has now been changed to:

ORDPPARAM<position index>

Fixed

build 20080527.

5.6.11 FetchSize is not Correctly Set for RdbCommands Containing Input or Output Parameters.

During the internal preparation of the SQL statement associated with an `RdbCommand` the `RdbConnection` FetchSize is copied to the newly prepared statement and it is this value that is used in subsequent executions of the statement to determine the number of records that should be passed between the client and the server process for each network IO.

A problem in how the FetchSize value is determined may prevent the correct FetchSize being set for the statement if the RdbCommand contains any RdbParameters.

For example:

```
// C#
RdbConnection db = new RdbConnection (ConnectionString);
db.Open();
RdbCommand cmd = new RdbCommand(
    "select * from  t1 where f1 = :VAL1", db);
db.FetchSize = 1;
```

will NOT set the FetchSize correctly and multiple records may still be returned during a single Network IO.

This problem has now been fixed.

Fixed

build 20080602.

5.6.12 Default FetchSize May be Set Incorrectly.

If not explicitly set, ORDP is documented to use a default FetchSize of 100 for both the `RdbCommand` and `RdbDataReader` classes.

However a problem in how the default value is determined causes ORDP to set the default FetchSize to 1 in certain circumstances.

If the `RdbCommand` is instantiated and the `CommandText` property set prior to the associated `RdbConnection` being Open, ORDP will default the `RdbCommand` FetchSize to 1.

The following example shows the type of code that will show this problem:

```
// C#
using (conn = new RdbConnection(cs))
{
  RdbCommand cmd = new RdbCommand(
     "SELECT …", conn);
  cmd.Connection.Open();
.
.
.
```

A work-around for this problem is to Open the `RdbConnection` prior to establishing the `RdbCommand` or setting the `RdbCommand CommandText` property:

```
// C#
using (conn = new RdbConnection(cs))
{
  cmd.Connection.Open();
  RdbCommand cmd = new RdbCommand(
     "SELECT …", conn);
.
.
.
```

An alternative word-around is to set the `RdbCommand FetchSize` explicitly .

```
// C#
using (conn = new RdbConnection(cs))
{
  RdbCommand cmd = new RdbCommand(
    "SELECT …", conn);
  cmd.FetchSize = 100;
  cmd.Connection.Open();
.
.
.
```

Fixed
build 20080527.

5.6.13 ExecuteNonQuery() Returns wrong number of Records Affected.

The `RdbCommand.ExecuteNonQuery()` method returns an integer value specifying the number of rows affected by the command.

A problem in how the `RdbDataAdapter` determined the number of records affected during delete operations causes the value returned to be always set to zero.

Although the return value is incorrect the DataAdapater will carry out the underlying deletions correctly.

This problem only affects connections using SQL/Services connectivity.

5.6.14 Concurrency Violation Exception Incorrectly Raised.

When the `RdbDataAdapter.Update()` method is called, the contents of the internal cache of records is checked to see if any records need to be inserted, deleted or updated in the database.

During this update process the DataAdapter will issue the appropriate SQL statements to make the updates to the underlying database table. During the execution of these updates the DataAdapter checks to see the number of records altered, and if the number is not the number expected an exception similar to the following will be raised:

System.Data.DBConcurrencyException: Concurrency violation: the DeleteCommand affected <n1> of the expected <n2> records.

A problem in how the `RdbDataAdapter` determined the number of records affected by the update statement may cause this exception to be raised incorrectly.

The DataAdapater will carry out the underlying updates correctly and the database will have the updates correctly applied to it, but after the updates have been applied this exception may be raised.

This problem only affects connections using SQL/Services connectivity.

5.6.15 Overflow/Underflow Exception not Raised on RdbParameter Assignments.

The assignment of a value to an RdbParameter with an integer DbType does not raise an overflow or underflow exception if the value is outside the range allowed for the given DbType.

Instead the value is cast to the appropriate datatype that may truncate the value.

For example, the following statement will silently truncate the value specified:

```
// C#
RdbParameter p1 =
  new RdbParameter(":iEMPNO", DbType.Int16,9999999999, "EMPNO");
```

This has now been changed, overflow or underflow of integer values in RdbParameter value assignments will now raise an appropriate exception.

5.6.16 Possible Memory Leak due to RdbDataAdapter.Dispose() Problem.

The RdbDataAdapter.Dispose() method does not correctly dispose of all of its children objects which may mean that memory may be slowly used up in long–lasting RdbConnection instances.

This problem affects only the .NET objects used within the RdbDataAdapter and RdbConnection, all underlying database and SQL/Services resources are correctly deallocated on the Dispose of the RdbDataAdapter or the closing of any DataReader objects used by the RdbDataAdapter.

Oracle advises that RdbDataAdapter objects should be explicitly disposed once they are no longer required instead of relying on the .implicit disposal done by the .NET Garbage Collector.

For example:

```
// C#
DataSet ds = new DataSet();
string selectString = "select * from JOBS";
RdbDataAdapter adapter =
     new RdbDataAdapter(selectString, conn);
adapter.Fill(ds);
.
.
.
adapter.Dispose();
```

Fixed

build 20080626.

5.6.17 Memory access problem with SetStrVal.

When passing string parameters to the underlying SQL statement, ORDP must convert from the internal .NET string format encoded in UNICODE to the character set specified for the destination column or variable. During this conversion a problem in how data is copied between internal buffers may cause the following exception to be raised:

Attempted to read or write protected memory

and the stack trace will contain reference to the following method:

    Oracle.DataAccess.RdbClient.Common.SQS.SetStrVal

This problem only affects connections using SQL/Services connectivity.

Fixed

build 20080707.

5.6.18 DataAdapter.Fill() may Lose Last Column in Select.

The DataAdapter.Fill() method may fail to deliver the last select column to the DataSet when the select statement contains references to multiple tables.

This problem only affects statements that do not return simple, single-table dbkeys. Depending on the SQL statement the simple parser used by the drivers may fail to recognize that the statement cannot return a simple dbkey, in which case the driver will expect that the last column returned by the database server will be the row's dbkey. If this occurs the last column of the selection will not be added to the resultant DataSet.

For example:

```
// C#
DataSet ds = new DataSet();
string selectString =
@"select first_name, last_name from (employees) inner join
salary_history on employees.employee_id =
salary_history.employee_id where employees.last_name = 'Toliver'";

RdbDataAdapter adapter =
      new RdbDataAdapter(selectString, conn);
adapter.Fill(ds);
.
.
.
```

In the above example the parenthesis around the employees table reference prevents the simple parser from determining that dbkeys will not be returned.

Removing the parenthesis will allow the DataSet to be created correctly.

This problem only affects connections using Thin Server connectivity.

Fixed
build 20080731.

5.6.19 DbType.Time datatype not handled correctly by RdbParameter

When a value is set in an RdbParameter, ORDP will try to convert the input value specified to a value and datatype that is compatible with the underlying database object.

If the RdbParameter datatype is `DbType.Time` the conversion is not handled correctly and ORDP will raise the following one of the following exceptions:

System.NullReferenceException: Object reference not set to an instance of an object

or

%RDB-E-ARITH_EXCEPT, truncation of a numeric value at runtime -COSI-F-IVTIME, invalid date or time

When reading a TIME column from the database, problems in the conversion may also cause the following exception to be raised:

System.FormatException: String was not recognized as a valid DateTime

Fixed

build 20080807.

5.6.20 Multiple Threads Connecting Concurrently may cause an Access Violation.

When multiple threads within a single process create concurrent RdbConnections it is possible that an Access Violation may be thrown in the RDBNET.DLL.

Multiple concurrent threads can be handled by ORDP, however there is a chance that two concurrent threads within a single process attempting to establish connections at exactly the same time may interact and cause one thread to fail with an Access Violation.

This problem only affects connectivity using SQS type connections.

Fixed

build 20080829.

5.6.21 Setting RdbConnection.Autocommit may cause Null Pointer Exception.

Trying to set the RdbConnection.Autocommit property when the connection is not open will fail with a Null Pointer exception.

Fixed

build 20081202.

5.6.22 Read-Write transactions incorrectly started within ReadOnly Connections.

Setting a Connection to ReadOnly indicates to the underlying Data Provider that only read operations should be executed on the database.

In addition if a connection has been set ReadOnly, ORDP will try to use Read Only transactions on the underlying database whereever possible.

A problem in ORDP prevents it from determining the correct transaction to use within a ReadOnly connection when the following RdbConnection methods are called.:

> BeginTransaction()
> BeginTransaction(IsolationType)

BeginTransaction(String)

This has now been fixed.   If the RdbConnection has been set ReadOnly:

BeginTransaction() – will now start a READ ONLY transaction
BeginTransaction(IsolationType) – will raise an exception as READ WRITE transactions
are not supported within a ReadOnly connection
BeginTransaction(String) – will raise an exception if the transaction string supplied does
not start with "read only".

Fixed

build 20081202.

5.6.23 Connection.State Incorrect after execution of DataReader on Stored Procedure.

When a `DataReader` is executed on an `RdbCommand` with type `CommandType.Stored Procedure, the RdbConnection.State` is incorrectly left at `ConnectionState.Fetching`.

Subsequent operations on the connection may result in the following exception:

System.InvalidOperationException:
Operation is not valid due to the current state of the object.

Example

```
// C#
.
.
.
RdbCommand cmd = new RdbCommand(conn);
RdbTransaction txn = conn.BeginTransaction();

cmd.CommandType = CommandType.StoredProcedure;
cmd.CommandText ="testParam2";
RdbCommandBuilder.DeriveParameters(cmd);
IDataReader reader = cmd.ExecuteReader();
while (reader.Read())
{
.
.
.
}

txn.Rollback() //←  exception may be thrown here
```

Fixed

build 20090102.

5.7 New Features for Release 7.3.0.1

This section describes new and changed features in Oracle Rdb Data Provider for .NET release 7.3-01

5.7.1 RdbFactory and RdbConnectionStringBuilder Classes

New classes have been added to ORDP to provide support for DbProviderFactories.

The new `RdbFactory` and `RdbConnectionStringBuilder` classes allow the .NET developer to utilize generic DataProvider classes to access and interact with Oracle Rdb.

Introduced in .NET V2.0, generic data provider classes and methods may be used to access ADO.NET compliant data sources. Using these generic classes improves the development of code that is independent of specific data providers.

```csharp
// C#
.
.
.
string res;
string cs = "Server=MYNODE:MY_SRV;Database=MY_DBS:MF_PERSONNEL";
DbProviderFactory f =
  DbProviderFactories.GetFactory("Oracle.DataAccess.RdbClient");
DbConnection c = f.CreateConnection();
RdbConnectionStringBuilder sb = new RdbConnectionStringBuilder();
sb.ConnectionString = cs;
sb.TryGetValue("server", out res);
Console.WriteLine(" server = " + res);
sb.DataSource = "MY_DBS:personnel";
Console.WriteLine(" con str = " + sb.ConnectionString);

c.ConnectionString = sb.ConnectionString;
c.Open();
DbCommand cmd = c.CreateCommand();

cmd.CommandText =
  "select employee_id,last_name,birthday from employees";

IDataReader reader = cmd.ExecuteReader();
while (reader.Read())
{
        Console.Write(reader.GetInt32(0) + "\t");
        Console.Write(reader.GetString(1) + "\t");
        Console.Write(reader.GetDateTime(2));
        Console.WriteLine();
}
reader.Close();
c.Close();
.
.
.
```

See the Microsoft .NET V2.0 documentation for more details on writing data provider independent code.

5.7.2 Limited TransactionScope now available

TransactionScope may now be used with RdbEnlistments. However as ORDP does not currently support the use of distributed transactions, the support for TransactionScope is currently limited to transactions within single connections.

```csharp
// C#
.
.
.
RdbCommand cmd = new RdbCommand(
  "insert into customers values (888,1092,'GEORGE')", conn);
try
{
   using (TransactionScope scope = new TransactionScope())
   {
       //Create an enlistment object
       RdbEnlistment myEnlistment = new RdbEnlistment(conn);
       Guid myGuid = Guid.NewGuid();
       //Enlist on the current transaction with the enlistment object
       Transaction.Current.EnlistDurable(myGuid, myEnlistment,
           EnlistmentOptions.None);

     cmd.ExecuteNonQuery();
     scope.Complete();
   }
}
catch (System.Transactions.TransactionException ex)
{
    Console.WriteLine(ex);
}
.
.
.
```

See the Microsoft .NET V2.0 documentation for more details on TransactionScope.

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5.8 Corrections in Release 7.3.0.1

This section describes software errors corrected in the Oracle Rdb Data Provider for .NET release 7.3-01.

5.8.1 Input Parameter Marker Values not Correctly set when Using the SQL/Services Client Connectivity

A problem in how input parameters were passed across to SQL/Services prevented the correct values to be assigned prior to execution of prepared statements.

This problem only occurred when using SQL select statements that contained one or more input parameter markers in conjunction with a connection using a "Type=SQS" connectivity type.

The following is an example of code that may fail.

```
// C#
.
.
.
RdbCommand cmd = conn.CreateCommand(
 "select * from employees where employee_id = :id");
RdbParameter p = cmd.Parameters.Add(":id", DbType.String,5);
p.Value = "00164";
RdbDataReader rdr = cmd.ExecuteReader();
while (rdr.Read())
.
.
.
```

The Read() method would fail to find existing records as the value assigned to the input parameter was not be passed through to the Rdb Server correctly.

Fixed

build 20071023.

5.8.2 Using RdbCommand.CommandType other than TEXT May cause SQL Syntax Exceptions

During the processing of RdbCommands the CommandType of the command was lost preventing ORDP from interpreting the command correctly during execution.
For example establishing a Stored Procedure type command:

```
// C#
RdbCommand cmd = conn.CreateCommand();
cmd.CommandType = CommandType.StoredProcedure;
cmd.CommandText = "TEST_PROC_1";
```

may fail with a syntax error as the CommandType will be redefined internally to text rather than StoredProcedure.

Fixed

build 20071110.

5.8.3 Cultural Information Settings may Cause Invalid numeric values to be Sent on SQL/Services service-based RdbConnections

When using SQL/Services connectivity for RdbConnections in conjunction with client Cultural Locales that have numeric representations that differ from standard English usage, a problem in the handling of the conversion of numeric values to their string representation may cause Rdb to receive invalid numeric data.

Clients using Locales that use alternate decimal point representation in the text form of numeric literals, for example the use of the comma character ',' for the decimal point in German Locales, may find problems when floating-point values or Decimal values containing fractional values are used.

Fixed

build 20071204.

5.8.4 BigDecimal and Floating Numeric Problem when using Thin Server connectivity

When using Thin Server connectivity for RdbConnections a problem in how data is transferred between the client and the Thin Server may cause invalid values to be sent to the database server.

During the processing of BigDecimal datatypes that have one or more fractional digits or float or double datatypes, a problem with endian representation caused the values to be misinterpreted on the server side.

This problem could lead to various exceptions being raised on the server such as Arithmetic Overflow or Invalid floating point representations.

Fixed

build 20071204.

5.8.5 DateTime Values incorrect when using SQL/Services connectivity

When using Oracle SQL/Services connectivity for RdbConnections a problem in how dates are transferred may cause invalid values to be sent to the database server.

During the processing of DateTime datatypes a problem with the conversion to and from SQS/Services Generalized Date and internal .NET DateTime datatypes caused the values to be misinterpreted on the server side.

This problem could lead to incorrect date/time values being stored in and retrieved from the database.

Fixed

build 20080208.

5.8.6 RdbCommandBuilder Does Not Automatically Open Connection.

During the building of the Update, Insert and Delete command from the Select command, the RdbCommandBuilder must connect to the database to establish information about the fields within the specified select statement.

If the associated RdbConnection has not been opened already, the RdbCommandBuilder is meant to open the connection and then close it again once it has retrieved the appropriate select statement metadata.

Unfortunately if the RdbConnection was not already open the RdbCommandBuilder failed to open it causing subsequent operations to fail with:

```
RdbCommand connection is not open
```

A work-around for the problem is to explicitly open the RdbConnection prior to using the RdbCommandBuilder methods.

Fixed

build 20080219.

5.8.7 RdbCommandBuilder May Lose Internal Statements

During the establishment of an RdbCommand, simple parsing of the SQL command text is carried out to establish the list of statements contained in the original CommandText and their associated parameter markers.

Unfortunately this information may be lost during the copying of RdbCommand properties from the original RdbDataAdapter to a newly established RdbDataReader used by the RdbDataAdapter.

This in turn may prevent the RdbCommandBuilder class from correctly establishing the original SQL statements and building associated Insert, Delete and Update commands.

This may show up as the following exception that may be raised during the creation of the auxiliary SQL update statements:

```
RdbCommand CommandText does not contain any SQL statements
```

Fixed
build 20080219.

5.8.8 RdbCommandBuilder Fails to Recognize Unique Columns

When the RdbCommandBuilder class tries to build associated Delete and Update commands from the Select command text, it requires that there exists at least one field in the select list that is either Unique or a Primary Key.

A problem in determining if a column was Unique prevented the RdbCommandBuilder from correctly using Unique columns as search keys.

Even if there are Unique columns in the table, if there are no Primary Keys available the automatic creation of Delete and Update Commands from a Select command would fail with the following message:

```
 RdbCommandBuilder cannot operate on queries with no unique or key
columns
```

This has now been fixed.

However in the case of a JDBC Thin Server connection, this problem will still persist. A future version of the Oracle JDBC for Rdb drivers and server will fix this problem.

Fixed
build 20080219.

5.8.9 RdbCommandBuilder Incorrectly used Blob Columns in Where Clause.

During the creation of the "where" clause for Delete or Update commands, the RdbCommandBuilder incorrectly included Blob columns (Oracle Rdb datatype "list of byte varying ") in the where conditions.

This has now been fixed.

Fixed
build 20080219.

5.8.10 Some LATIN1 Characters May not be Retrieved Correctly from the Database.

A problem with the conversion of DEC_MCS characters from Oracle Rdb to internal UNICODE representation for use with .NET caused characters with hexadecimal values greater than 0x7F to be incorrectly translated.

This meant that LATIN1 characters containing special diacritic marks were replaced with a character representing an unprintable UNICODE character when retrieved or displayed within the .NET environment.

This problem is independent of the LOCALE or local language settings.

This has now been fixed.

Fixed

build 20080305.

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