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Accessing a Database LOB Using REP++

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Overview

A BLOB (Binary Large Object), or its more generic form, a LOB (Large Object), is a large-sized file, such as an image, video, text, etc., stored in a database field. Because of their size, LOBs cannot be retrieved in a single block of data, but in a series of smaller chunks of data. REP++ provides a way to seamlessly access a LOB stored in a database. This article describes how to read or write LOBs in databases using REP++.

Drivers that support access to LOBs

The following REP++ database drivers support access to LOBs.

- Oracle® Net/8
- SQL Server/dblib ¹
- SQL Server 2005 ^{1,2}

Using REP++ to access a LOB

REP++ provides a way to create code that will work with all REP++ drivers supporting LOB access. The **RepPP.Connection.BuildLOBCommand** command is used to build a set of SQL commands to:

- Initialize a LOB
- Read from a LOB
- Write to a LOB.

The generated SQL commands are different for each driver. Note that the initialization step is not required for SQL Server, and the returned SQL command is therefore empty.

Generated SQL commands for SQL Server

Init: Empty

Read: SELECT TEXTPTR(MyLob),DATALENGTH(MyLob) FROM TESTLOB FOR READING IMAGE

Write: SELECT TEXTPTR(MyLob),DATALENGTH(MyLob) FROM TESTLOB FOR UPDATING IMAGE

Generated SQL commands for Oracle

Init: UPDATE TESTLOB SET MYLOB = empty_blob() WHERE KEY1=:KEY

Read: SELECT MYLOB FROM TESTLOB WHERE KEY1=:KEY

¹ Limit of 8000 bytes per chunk. The column must be of type IMAGE or TEXT.

² Not supported with ODBC (SQL Server 2005). See section **Special notes for SQL Server 2005**, page 4.

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Write: SELECT MYLOB FROM TESTLOB WHERE KEY1=:KEY FOR UPDATE OF MYLOB

Table 1. REP++ methods for accessing LOBs.

Methods	Definition
RepPP.SqlCursor.GetLOBLength	Return the actual LOB size.
RepPP.SqlCursor.ReadLOBPart	Read a chunk of data from a LOB.
RepPP.SqlCursor.TrimLOB	Trim the size of a LOB.
RepPP.SqlCursor.WriteLOBPart	Write a chunk of data to a LOB.

Creating a LOB from a file

The following code example (written in C#) demonstrates how to create a LOB from a file.

```
// Read an image from a file and save it to database.

private void WriteImageToDB(RepPP.Connection conn, string strImageName, string strKey) {
    FileStream          stream;
    string              strSqlCmd;
    RepPP.SqlCommand   sql;
    RepPP.SqlCursor    cur = null;
    int                iPos;
    int                iRdSize;
    int                iSize;
    byte[]             arrBytes;
    byte[]             arrBytesToWrite;

    // Initialize the BLOB. Oracle requires this step, but SQL Server does not.

    strSqlCmd = conn.BuildLOBCommand("TESTLOB", "MYLOB", "WHERE KEY1=:KEY",
        RepPP.LOBAccessType.sdLOBInit);
    if (strSqlCmd != String.Empty) {
        using(sql = conn.SqlCommands.Open(strSqlCmd)) {
            sql.SetParameterValue("KEY", strKey, RepPP.FieldType.sdFieldString);
            if (sql.Execute(out cur) != 0) {
                throw new System.ApplicationException(conn.ErrorMessage);
            }
        }
    }

    // Fill the blob.

    strSqlCmd = conn.BuildLOBCommand("TESTLOB", "MYLOB", "WHERE KEY1=:KEY",
        RepPP.LOBAccessType.sdLOBUpdate);
    sql = conn.SqlCommands.Open(strSqlCmd);
    if (sql == null) {
        MessageBox.Show(conn.ErrorMessage);
    } else {
        using(sql) {
            sql.SetParameterValue("KEY", strKey, RepPP.FieldType.sdFieldString);
            if (sql.Execute(out cur) == 0) {
                using(cur) {
                    if (cur.Next() == 0) {
                        cur.TrimLOB(0, 0);
                        using(stream = new FileStream(strImageName, FileMode.Open)) {
                            iPos = 0;
                            arrBytes = new byte[8000];
                            iRdSize = stream.Read(arrBytes, iPos, 8000);
                            while (iRdSize != 0) {
                                if (iRdSize == 8000) {
                                    arrBytesToWrite = arrBytes;
                                } else {
                                    arrBytesToWrite = new byte[iRdSize];
                                    Array.Copy(arrBytes, 0, arrBytesToWrite, 0, iRdSize);
                                }
                            }
                        }
                    }
                }
            }
        }
    }
}
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```
        }
        iSize = cur.WriteLOBPart(0, iPos, arrBytesToWrite);
        if (iSize <= 0) {
            throw new System.ApplicationException("Unable to
                write the blob to the database");
        }
        iPos += iRdSize;
        iRdSize = stream.Read(arrBytes, 0, 8000);
    }
}
}
}
} else {
    MessageBox.Show(conn.ErrorMessage);
}
}
}
conn.Commit();
}
```

Creating a file from a LOB

The following code example (written in C#) demonstrates how to create a file from a LOB.

```
// Read an image from database and save it in a file.
private void WriteImageToFile(RepPP.Connection conn, string strImageName, string strKey)
{
    FileStream          stream;
    string              strSqlCommand;
    RepPP.SqlCommand   sql;
    RepPP.SqlCursor    cur = null;
    int                 iPos;
    int                 iSize;
    int                 iRdSize;
    byte[]              arrBytes;
    byte[]              arrBytesToRd;

    strSqlCommand = conn.BuildLOBCommand("TESTLOB", "MYLOB", "WHERE KEY1=:KEY",
        RepPP.LOBAccessType.sdLOBRead);
    sql = conn.SqlCommands.Open(strSqlCommand);
    if (sql == null) {
        MessageBox.Show(conn.ErrorMessage);
    } else {
        using(sql) {
            sql.SetParameterValue("KEY", strKey, RepPP.FieldType.sdFieldString);
            if (sql.Execute(out cur) == 0) {
                using(cur) {
                    if (cur.Next() == 0) {
                        using(stream = new FileStream(strImageName, FileMode.Create)) {
                            iPos = 0;
                            iSize = cur.GetLOBLength(0);
                            arrBytes = new byte[8000];
                            while (iPos < iSize) {
                                iRdSize = iSize - iPos;
                                arrBytesToRd = (iRdSize >= 8000) ? arrBytes :
                                    new byte[iRdSize];
                                iRdSize = cur.ReadLOBPart(0, iPos,
                                    ref arrBytesToRd);

                                if (iRdSize <= 0) {
                                    throw new System.ApplicationException("Unable to read
                                        the blob from the database");
                                }

                                iPos += iRdSize;
                                stream.Write(arrBytesToRd, 0, iRdSize);
                            }
                        }
                    }
                }
            }
        }
    }
}
```

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```
        }  
    } else {  
        MessageBox.Show(conn.ErrorMessage);  
    }  
}  
}
```

Special notes for SQL Server 2005

The SQL Server driver is using a stored procedure to access the LOB. For that reason, the driver will create the stored procedures if necessary. The connection must have the necessary rights to do so. If not, the DBA must create the stored procedures manually.