



odbcdcl: Recio ODBC DCL Generator Access
Method Version 1

CML00064-01

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1 Introduction

The `odbcdbl` access method is a module which implements the `recio` [1] provider interface allowing the `recio` [1] user interface to support reading meta-data associated with an SQL query from an ODBC data source. This access method extends the scope of accessing meta-data via `recio` [1] to any data source that can be defined by an ODBC data source name and should be used in conjunction with the `odbc` access method [2] which reads records from an ODBC data source as described by this generated meta-data.

2 Open String Specification

As with all `recio` [1] library open specification strings, three components comprise the open string: access method, object, and options name-value pairs.

2.1 Open Specification Access Method Name

The access method name should be specified as `odbcdbl`.

2.2 Open Specification Object Name

The object name is an SQL query statement that resolves to a result set. This is usually a select statement.

2.3 Open Specification Option Name-Value Pairs

Consult the access method definition file for the option name-value pairs supported by the `text` access method. The access method definition file also supplies details of the default values (if any) of the options.

2.4 Open String Specification Examples

2.4.1 Introduction

All the following examples are used to generate the meta-data of the examples referred to in `odbc`: Recio ODBC Access Method Version 1 [2]; also refer to that manual for the example definitions of the ODBC configuration files.

These examples and ODBC configuration files were run against and adhere to these versions of the respective databases:

- MySQL.

```
hayward@giraffe:odbcam>mysql -V
mysql Ver 14.14 Distrib 5.1.42, for suse-linux-gnu (i686) using readline 6.0
```

- UDB DB2.

```
hayward@giraffe:odbcam>db2
(c) Copyright IBM Corporation 1993,2007
Command Line Processor for DB2 Client 9.7.0
```

- Oracle.

```
hayward@giraffe:odbcam>sqlplus -v

SQL*Plus: Release 10.2.0.1.0 - Production
```

2.4.2 MySQL example

The following example shows the meta-data generated from a MySQL database catalogue when retrieving a list of schema and tables using the data source name (DSN) MySQL.

```
hayward@giraffe:odbcam>cmlcopy -i "odbccl([select table_schema,
      table_name from information_schema.tables],source=MySQL)"
      -o "standard(out)"
Code Magus Limited Filetools V2.0: build 2010-03-17-16.36.58
[cmlcopy] $Id: odabcdclam.tex,v 1.5 2017/10/20 14:38:38 hayward Exp $
Copyright (c) 2001, 2002 by Stephen Donaldson. All rights reserved.
Copyright (c) 2003--2009 by Code Magus Limited. All rights reserved.
[Contact: stephen@codemagus.com].
-- Generated SQLDDL by CML ODBC
-- From Data Source name MySQL using SQL statement:
-- select table_schema,table_name from information_schema.tables
-- TimeStamp: 2010-03-25-13.04.22.755164
--
      EXEC SQL DECLARE RESULT.ODBCquery TABLE
      (
      TABLE_SCHEMA          VARCHAR(64) NOT NULL,
      TABLE_NAME            VARCHAR(64) NOT NULL
      ) END-EXEC.
odbcdcl([select table_schema,table...]): Input Records = 10.
standard(out): Output Records = 10.
```

2.4.3 UDB DB2 example

The following example shows the meta-data generated from a UDB DB2 database catalogue when retrieving a list of owners and tables using the data source name (DSN)

SAMPLE.

```

hayward@giraffe:odbcam>cmlcopy -i "odbccl([select creator,name
      from sysibm.systables],source=SAMPLE)" -o "standard(out)"
Code Magus Limited Filetools V2.0: build 2010-03-17-16.36.58
[cmlcopy] $Id: odbcclam.tex,v 1.5 2017/10/20 14:38:38 hayward Exp $
Copyright (c) 2001, 2002 by Stephen Donaldson. All rights reserved.
Copyright (c) 2003--2009 by Code Magus Limited. All rights reserved.
[Contact: stephen@codemagus.com].
-- Generated SQLDDL by CML ODBC
-- From Data Source name SAMPLE using SQL statement:
-- select creator,name from sysibm.systables
-- TimeStamp: 2010-03-25-13.07.38.307536
--
      EXEC SQL DECLARE RESULT.ODBCquery TABLE
      (
        CREATOR              VARCHAR(128) NOT NULL,
        NAME                  VARCHAR(128) NOT NULL
      ) END-EXEC.
odbccl([select creator,name from sys ... ]: Input Records = 10.
standard(out): Output Records = 10.

```

2.4.4 Oracle example

The following example shows the meta-data generated from an Oracle database catalogue when retrieving a list of owners and tables using the data source name (DSN) OracleODBC10g.

```

hayward@giraffe:odbcam>cmlcopy -i "odbccl([select owner,table_name
      from all_all_tables],source=OracleODBC10g,user=system,
      password=sys)" -o "standard(out)"
Code Magus Limited Filetools V2.0: build 2010-03-17-16.36.58
[cmlcopy] $Id: odbcclam.tex,v 1.5 2017/10/20 14:38:38 hayward Exp $
Copyright (c) 2001, 2002 by Stephen Donaldson. All rights reserved.
Copyright (c) 2003--2009 by Code Magus Limited. All rights reserved.
[Contact: stephen@codemagus.com].
-- Generated SQLDDL by CML ODBC
-- From Data Source name OracleODBC10g using SQL statement:
-- select owner,table_name from all_all_tables
-- TimeStamp: 2010-03-25-13.10.26.353068
--
      EXEC SQL DECLARE RESULT.ODBCquery TABLE
      (
        OWNER                VARCHAR(30),
        TABLE_NAME          VARCHAR(30)
      ) END-EXEC.
odbccl([select owner,table_name from all ... ]: Input Records = 10.
standard(out): Output Records = 10.

```

3 odbcdcl access method definition file

The access method definition file should be consulted for the description of the options and their default values. This includes the description of the options. The access method definition file should also be consulted for the processing modes supported by the access method.

Refer to the `recio` library documentation for interpreting the contents of the access method definition file.

```
access odbcdcl(source,user="NA",password="NA",null_indicator="?",nulls="after",
    init_image=" ",meta_data="YES");

-- File: ODBCDC1.amd
--
-- This file contains an access method definition which is used to read
-- the meta data associated with an ODBC query that will be used to read data
-- from the ODBC access method.
-- The meta data is consistent to a SQL DECLARE TABLE statement that can be
-- processed into mappings useable by all Code Magus tools and products. An
-- example is the creation of COBOL copy books using dcl2book to convert the
-- DCL statements to COBOL.
--
-- Author: Code Magus Ltd [codemagus.codemagus.com].
--
-- Copyright (c) 2010 Code Magus Limited. All rights reserved.

-- $Author: hayward $
-- $Date: 2017/06/01 20:43:27 $
-- $Id: ODBCDC1.amd,v 1.4 2017/06/01 20:43:27 hayward Exp $
-- $Name: $
-- $Revision: 1.4 $
-- $State: Exp $
--
-- $Log: ODBCDC1.amd,v $
-- Revision 1.4 2017/06/01 20:43:27 hayward
-- Allow any character in the password entry.
--
-- Revision 1.3 2015/09/24 20:38:14 hayward
-- Allow the access method to use
-- SQLDriverConnect() to connect.
-- To do this the user codes the source name
-- as "dc:<driver parms>". This enables the use
-- of DSNless connections where the Data Source
-- does not need to be defined in odbc.ini.
-- For example for SQLite, instead of defining
-- a data source for every database file on a
-- system, use a source that looks like this:
-- "dc:Database=/path/to/database.sqlite3;Driver=SQLite"
-- where only the driver has to be pre-registered.
--
```

3 ODBCDCCL ACCESS METHOD DEFINITION FILE

```
-- Revision 1.2 2013/01/22 11:29:38 hayward
-- Add \ to set of valid characters for the user
-- as it is required when connecting to SQLServer
-- using a domain user of the form domain\user.
--
-- Revision 1.1 2010/03/10 11:56:20 hayward
-- Separate the data and meta-data access into
-- two distinct access methods. They are "odbc"
-- for data access and "odbcdcl" for meta-data
-- access.
--
modes seq_input;

implements open;
implements close;
implements read;

describe source as
    "source is the ODBC data source name to connect to as defined in "
    "the ODBC configuration ODBC.ini. If the source name starts with "
    "DC: (lower or upper case) then SQLDriverConnect() is used and "
    "source holds the connection parameters. This may cause the source "
    "DSN to be bypassed. Consult the documentation of the driver being "
    "used for information on the parameters and values that may be set."
    ;

describe user as
    "user is the the user ID with which to connect to the ODBC data source."
    ;

describe password as
    "password is the the authentication string for specified user. "
    "If it has special characters then enclose it in [...]."
    ;

describe null_indicator as
    "null_indicator refers to the value the NULL indicator is set to when a "
    "column in a result set is NULL.";

describe nulls as
    "nulls refers to a single byte indicator for each DB2 NULLABLE "
    "column that is embedded in the result row either before or after "
    "the data for that column.";

describe init_image as
    "init_image refers to the value the bytes of each new row are "
    "initialised to before being fetched. This mostly affects VARCHAR "
    "type columns where trailing bytes of the column will be set to this "
    "value";

describe meta_data as
```

```

"meta_data is set to the value YES, which causes the access method to "
"write the meta-data of the result set as text records in the form of "
"an SQL DECLARE TABLE statement. This can be processed to create the "
"copy book used to map the data on a data request.";

constrain source as "^\\(\\([a-zA-Z0-9_]+\\)\\|\\([dD][cC]:.*\\)\\)$";
constrain user as "[a-zA-Z0-9_\\]|\\+$";
constrain password as ".*";
constrain null_indicator as "[A-Za-z!$%&*+##?]"$";
constrain nulls as "\\(before\\|after\\)$";
constrain init_image as "\\(\\.\\|0[xX][0-9a-fA-F][0-9a-fA-F]\\)$";
constrain meta_data as "\\([Yy][Ee][Ss]\\)$";

path = ${CODEMAGUS_AMDLIBS} "%s";
module = "odbcam" ${CODEMAGUS_AMDSUFDL};
entry = odbcam_init;

end.

```

4 Environment

The location and format of the access method definition file is required to be specified by the environment variable CODEMAGUS_AMPATH. This environment variable supplies a pattern to the full path of where access method definition (or amd) files are located. The format of the environment variable is that of a path with a %s appearing in the position in which the access method member name should appear. For example, on MVS systems this might have the form:

```
CODEMAGUS_AMPATH='DNCT00.SRDA1.AMDFILES(%s)'
```

On a Unix-based system, the value might be set in a shell profile file such as:

```
export CODEMAGUS_AMPATH=$HOME/bin/%s.amd
```

On Windows systems, the value might be supplied from the environment variables and look something like:

```
C:\CodeMagus\bin\%s.amd
```

References

- [1] recio: Record Stream I/O Library Version 1. CML Document CML00001-01, Code Magus Limited, July 2008. [PDF](#).
- [2] odbc: Recio ODBC Access Method Version 1. CML Document CML00063-01, Code Magus Limited, February 2010. [PDF](#).