CODE MAGUS

db2dclgen: Recio DB2 DCL Generator (DCLGN) Access Method Version 1

CML00051-01

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August 16, 2016

Contents

1 Introduction

The db2dclgn access method is a module which implements the recio [1] provider interface allowing the recio user interface to support generating a DCL (Declaration Control Language) definition of a DB2 SQL query. This enables generating meta-data in order to correctly map the result set returned from the same query by the access method db2query [2]. Support is provided for UDB on Linux, UNIX and Windows, and DB2 for z/OS.

The db2dclgn access method allows any select statement that does not include parameter markers to be used by the named DB2 instance or subsystem to generate the DCL.

2 Open String Specification

As with all recio 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 db2dclgn.

2.2 Open Specification Object Name

The object name must be a DB2 select statement without any parameter markers.

2.3 Open Specification Option Name-Value Pairs

Consult the access method definition file for the option name-value pairs supported by the db2dclgn access method. The access method definition file also supplies details of the default values (if any) of the options; see section 3 on page 3.

2.4 Open String Specification Examples

The following open string specification could be used to generate the DCL file for the table syscolumns on a DB2 instance on Linux.

```
db2dclgn([select * from sysibm.syscolumns],subsys=sample,
   user=another,password=anpwd)
```

Although the IBM supplied utility `db2dclgn` can also perform the above function. It, however, can only do this for single and complete tables. The following example will generate the DCL that describes the result set from the join of the two tables:

```
db2dclgn([select a.COL01, b.COL03 from user.table01 a,
   user.table02 b where a.char_01=b.CHAR_01],
   subsys=DSN1,plan=APLAN)
```

The output would look similar to this:

```
-- Generated SQLDDL by CML DB2DCLGN
-- From subsys mysubsystem using SQL statement:
-- select A.COL01, B.COL03 from USER.TABLE01 A, USER.TABLE02 B
--    where A.KEY01=B.KEY01
-- TimeStamp: 2009-11-25-14.27.15.020777
--
            EXEC SQL DECLARE RESULT.SQLDCLGN TABLE
            (  COL01                TIMESTAMP NOT NULL,
               COL03                CHAR(10) NOT NULL
            ) END-EXEC.
```

3 `db2dclgn` access method definition file

The access method definition file should be consulted for the description of the options and their default values. 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 db2dclgn(subsys,user="NA",password="NA",plan="DB2DCLGN",
                owner="RESULT",table="SQLDCLGN");

  -- File: DB2DCLGN.amd
  --
  -- This file contains an access method definition which is used to prepare
  -- a select statement for IBM's DB2 database and and return rows that define a
  -- DECLARE TABLE statement that used to be output by DB2 for zOS but is not
  -- for UDB. This also allows a DCLGEN to be created for ANY select statement.
  -- This DCLGEN can then be used as meta data via dcl2book for use in any CML
  -- software product that uses recio to access DB2 with the same select.
  -- records.
  --
  -- Author: Stephen R. Donaldson [www.codemagus.com].
  --
  -- Copyright (c) 2009 Code Magus Limited. All rights reserved.
  -- $Author: hayward $
  -- $Date: 2016/06/23 10:54:58 $
  -- $Id: DB2DCLGN.amd,v 1.3 2016/06/23 10:54:58 hayward Exp $
  -- $Name:  $
  -- $Revision: 1.3 $
  -- $State: Exp $
  --
  -- $Log: DB2DCLGN.amd,v $
  -- Revision 1.3  2016/06/23 10:54:58  hayward
  -- Allow the owner and table names on the
  -- EXEC SQL DECLARE owner.table TABLE
  -- statement of the output DCL to be
  -- supplied by the caller. The default
  -- remains as now RESULT.SQLDCLGN
  --
  -- Revision 1.2  2009/11/25 06:12:51  hayward
  -- Changes for port to MVS.
  --
  -- Revision 1.1.1.1  2009/09/30 18:45:25  hayward
  -- Initial import
  --

   modes seq_input;

   implements open;
   implements close;
   implements read;

   describe subsys as
      "The subsys defines which database instance to connect to for executing "
      "the select statement.";

   describe user as
      "The user is the DB2 user under wich the SQL will be executed. It is "
      "optional as some DB2 instances use the logged on user as the "
      "authorization ID.";

   describe password as
      "The password is the DB2 password under wich the SQL will be executed. It is "
      "optional as some DB2 instances use the logged on user as the "
      "authorization ID.";

   describe plan as
      "The plan is the MVS (z/OS) DB2 plan name under which the request "
      "should run. It is only applicable to running a query on MVS.";

   describe owner as
      "The owner is a descriptive parameter only and is used as the owner "
      "in the declare table statement ’EXEC SQL DECLARE owner.table TABLE’ "
      "of the generated DCL.";
```

```
   describe table as
      "The table is a descriptive parameter only and is used as the table "
      "in the declare table statement 'EXEC SQL DECLARE owner.table TABLE' "
      "of the generated DCL.";

   constrain subsys as "^.*$";
   constrain user as "^.*$";
   constrain password as "^.*$";
   constrain plan as "^.*$";
   constrain owner as "^.*$";
   constrain table as "^.*$";

   path = ${CODEMAGUS_AMDLIBS} "%s";
   module = "db2dclgnam" ${CODEMAGUS_AMDSUFDL};
   entry = DB2DINIT;

end.
```

4 Environment

The location and format of the access method definition file is required to be specified by the environment variable CODEMAGUS_AMDPATH. 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 z/OS systems this might have the form:

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

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

```
export CODEMAGUS_AMDPATH=$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
```

5 Installation on z/OS

Once the package has been unpacked, in order to use the db2dclgn access method on z/OS the steps below must be performed. Some of them only need to be done once and may already have been done for the installation of the db2query [2] access method.

1. Upload the DBRM to z/OS.
   Copy the DB2 for z/OS DBRM lib/db2dclgnam.mvs.dbrm to a PDS or

PDSE. The PDS is should be defined as fixed block with a record length of 80.

2. Bind the DBRM.
   Customise and submit the JCL bin/db2dclgnam.mvs.bind in order to bind the plan on the DB2 subsystem.

3. Grant the user that will execute the db2dclgn access to the plan. For example the following DB2 command grants execute permission on the plan to the user CMLUSER:

   ```
   grant execute on plan DB2DCLGN to CMLUSER;
   ```

4. In order to access DB2 via the DB2 RRSAF attachment facility in an OMVS controlled environment the security setting for the user under which the server runs needs to be changed. Read access must be granted to the facility BPX.DAEMON.HFSCTL for the user under which the server runs; This allows a controlled program to call a (non controlled) program that resides in a PDS or PDSE. The following RACF commands will allow the the server running under the user STARTED to call DB2:

   ```
   RDEFINE FACILITY BPX.DAEMON.HFSCTL UACC(NONE)

   PERMIT BPX.DAEMON.HFSCTL CLASS(FACILITY) ID(STARTED) ACCESS(READ)
   SETROPTS RACLIST(FACILITY) REFRESH
   ```

5. The user executing the query must be granted access to the DB2 sub system. Only read access is required. The following command shows granting the user CMLUSER access to the sub system DSN1.

   ```
   PERMIT DSN1.RRSAF ACCESS(READ) CLASS(DSNR) ID(CMLUSER)
   SETROPTS RACLIST(DSNR) REFRESH
   ```

6 Installation on Linux, Unix and Windows

Once the package has been unpacked, in order to use the db2dclgn access method on Linux, Unix and Windows the following steps must be performed:

1. Bind the DBRM.
   Using the db2 command bind the plan with the following command:

   ```
   connect to mysubsystem

   bind lib/db2dclgnam.bnd
   ```

   The name mysubsystem should be changed to the name of the subsystem on which to bind the plan; A user ID and password may also be required. See the DB2 documentation of the `bind` command for other parameters that may be relevant to the `DB2` instance.

References

[1] recio: Record Stream I/O Library Version 1. CML Document CML00001-01, Code Magus Limited, July 2008. PDF.

[2] db2query: Recio DB2 Query Access Method Version 1. CML Document CML00050-01, Code Magus Limited, November 2009. PDF.