

**TS-518A**

***SAS/ACCESS® Guidelines for Connecting to  
DB2/6000® Databases on AIX/RS6000® Systems***

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## **Abstract**

*Due to the increased interest of the SAS/ACCESS Interface to DB2/6000 product on AIX/RS6000 systems, this topic has been a popular discussion for a number of SAS users. This paper documents the necessary steps and clarifies the issues involved with connecting to DB2/6000 databases using SAS/ACCESS.*

## **Introduction**

*The SAS/ACCESS Interface to DB2/6000 product only includes support for the SQL Procedure Pass-Through Facility and the SAS DBLOAD Procedure. The ACCESS Procedure is not available for the DB2/6000 interface.*

*The SAS/ACCESS product, in general, consists of three procedures: PROC ACCESS, PROC DBLOAD and PROC SQL Pass-Through. However, all three of these procedures may not be available for every relational database system (DBMS) on every UNIX platform. Users should be familiar with what procedures their SAS/ACCESS product supports for their platform. An addendum has been included for the SAS/ACCESS Interface to DB2/6000 support.*

*The DB2 Command Line Processor is available with DB2/6000 to provide users the capability to retrieve and create data stored in the DB2/6000 database. Users or the Database Administrator (DBA) should be familiar with this utility because it can make the SAS/ACCESS connection process much easier.*

*The discussion, necessary steps, and examples that follow were run on an AIX/RS6000 system using SAS 6.11 TS020, and demonstrate the use of the DB2/6000 DB2 Command Line Processor and successful connections to databases using SAS/ACCESS.*

## **Using the DB2/6000 DB2 Command Line Processor**

*In order to connect to a DB2/6000 database locally or remotely from SAS, you must be able to connect to the same database outside of SAS. You can establish a connection outside of SAS by using the DB2/6000 command line processor, DB2.*

*Once a successful database connection is made using the DB2 Command Line Processor, you should be able to connect to the same database from within SAS with the **same** environment and userid. Below are some simple steps to verify whether you are able to connect to a DB2/6000 database outside of SAS successfully.*

- 1) *Invoke the DB2 Command Line Processor as follows:*

```
unix_prompt> db2
```

- 2) *Once you successfully invoke the DB2 Command Line Processor, you will receive information similar to the following. If you are having problems invoking the DB2 Command Line Processor, you will need to contact your DBA or IBM Technical Support for assistance.*

```
(c) Copyright IBM Corporation 1993,1995  
Command Line Processor for DB2 SDK 2.1.1
```

You can issue database manager commands and SQL statements from the command prompt. For example:

```
db2 => connect to sample  
db2 => bind sample.bnd
```

For general help, type: ?.

For command help, type: ? command, where command can be the first few keywords of a database manager command. For example:

```
? CATALOG DATABASE for help on the CATALOG DATABASE command  
? CATALOG           for help on all of the CATALOG commands.
```

To exit db2 interactive mode, type QUIT at the command prompt. Outside interactive mode, all commands must be prefixed with 'db2'. To list the current command option settings, type LIST COMMAND OPTIONS.

For more detailed help, refer to the Online Reference Manual.

```
db2 =>
```

- 3) *From the DB2 command line, connect to the database(s) that you plan to connect to, with SAS, using the system default user name and password (where db\_name is a valid database name for connecting):*

```
db2 => connect to db_name
```

*Use the following syntax, if you need to specify the user name and password (where db\_name, usr\_name and password are valid DB2 user name and password):*

```
db2 => connect to db_name user usr_name using password
```

- 4) *Once you successfully connect to the database specified, you will receive information similar to the following. If you are having problems connecting to the database, you will need to contact your DBA or IBM Technical Support for assistance.*

```
Database Connection Information
Database product      = DB2/6000 PE 1.2.0
SQL authorization ID = SAS
Local database alias = DB_NAME
```

```
db2 =>
```

- 5) *To verify that you have been granted the appropriate privileges, submit some SQL code from the DB2 command line, similar to what you plan to submit from within SAS. If you experience problems with privileges or submitting SQL from the DB2 Command Line Processor, you will need to contact your DBA or IBM Technical Support for assistance. Below is a simple SQL select statement and its results (where tbl\_name is a valid table name in the database that you are connected):*

```
db2 => select * from tbl_name
```

DEPTNO	DEPTNAME	MGRNO	ADMRDEPT	LOCATION
A00	SPIFFY COMPUTER SERVICE DIV.	000010	A00	-
D01	DEVELOPMENT CENTER	-	A00	-
E11	OPERATIONS	000090	E01	-
C01	INFORMATION CENTER	000030	A00	-
D11	MANUFACTURING SYSTEMS	000060	D01	-

```
5 record(s) selected.
```

- 6) *You have just demonstrated that you can connect to the DB2 database outside of SAS. Before you attempt to bring up SAS and try to connect using SAS/ACCESS, be sure that you use the **exact** usr\_name, password, and db\_name that you used with the DB2 Command Line Processor.*

## **Using SAS/ACCESS Interface to DB2/6000**

*Before you attempt to connect to a DB2/6000 database using SAS/ACCESS, you must be able to connect to the same database outside of SAS using the DB2 Command Line Processor as demonstrated above. Once you have verified that you can connect to the database(s) using the DB2 Command Line Processor, you should be able to connect to the same database(s) from within SAS, assuming the following requirements have been met.*

- You are invoking SAS using the **exact** environment and userid used to invoke the DB2 Command Line Processor and connected to the database(s) successfully.
- You have performed the SAS/ACCESS Interface to DB2/6000 Installation Instructions from APPENDIX B of the "Installation Instructions for the SAS System under UNIX Environments".

Note that, the SAS 6.11 Installation Instructions fail to state in Appendix B on pages 47 - 49 that there is a pre-linked DB2 SAS/ACCESS module shipped with SAS 6.11 and the custom install link is not required. The name of the module is !SASROOT/sasexe/dbi/sasptdb2. Therefore, make sure that the !SASROOT/sasexe/dbi/sasptdb2 module exists and that it has read and execute permissions.

- Make sure that the DB2 environment variable \$INSTHOME is set to the location of the DB2/6000 home/root directory.
- Make sure that the DB2 environment variable \$DB2INSTANCE is set.
- Make sure that the environment variable \$LIBPATH is set to the location of the DB2 home directory. SAS will use the libdb2.a "shared" library in that location. The following syntax can be used to set the variables:

**Bourne Shell:** LIBPATH=\$INSTHOME/lib:\$LIBPATH;  
export LIBPATH

**C Shell:** setenv LIBPATH \$INSTHOME/lib:\$LIBPATH

- You must bind the SAS application package DB2.SASDB2 to all databases with which you intend to use the SAS/ACCESS interface. The bind should be performed with the following DB2 command from within the DB2 Command Line Processor:

```
db2 => BIND !SASROOT/sas611/saspgm/dbi/obj/sasdb2.bnd
```

- Finally, you should grant execute privileges on the DB2.SASDB2 package to your users using the DB2 command line processor. For example,

```
db2 => GRANT execute on package DB2.SASDB2 to public
```

Once the above requirements have been met, you should be able to successfully connect to the DB2/6000 database(s) using the following steps:

- 1) *Invoke SAS with the **exact** environment and userid you used when you successfully connected to the database(s) using the DB2 Command Line Processor.*
- 2) *To verify your ability to successfully connect to a DB2/6000 database, submit the following PROC SQL Pass-Through code from the SAS Program Editor. Be sure the db\_name, usr\_name, password and tbl\_name are the same values used with the DB2/6000 DB2 Command Line Processor.*

```
proc sql;  
connect to db2(db=db_name user=usr_name using=password);  
  select * from connection to db2  
    (select * from tbl_name);  
disconnect from db2;  
quit;
```

*NOTE: If the usr\_name and password are the same as the operating system user name and password, the user= and using= options are not required. (They are only required if they were required when you connected using the DB2 Command Line Processor.)*

- 3) *If, when using SAS/ACCESS, you are unable to connect to the same DB2 database from the **exact** environment and userid that you were able to successfully connect to using the DB2 Command Line Processor, then contact SAS UNIX Technical Support at (919) 677-8008 and have the following information available:*
  - *the exact operating system release level and machine type*
  - *the exact DB2 release level*
  - *is the DB2 database local or remote. If remote, is the Client Application Enabler (CAE) used? If so, what is the CAE release?*
  - *the environment variable settings*
  - *the results from the steps documented above for both "Using the DB2/6000 DB2 utility" and "Using SAS/ACCESS."*
- 4) *Once you have connected successfully and want more details on using the DBLOAD Procedure or the SQL Procedure Pass-Through Facility, reference the SAS manuals listed in the CONCLUSION of this paper.*

## **Conclusion**

*This paper discussed the various aspects of connecting to DB2/6000 databases with both the DB2 Command Line Processor outside of SAS and with SAS using the SAS/ACCESS Interface to DB2/6000 product on AIX/RS6000 systems. This discussion included details and examples of using the DB2 Command Line Processor and the SAS SQL Procedure Pass-Through Facility.*

*For detailed information on the DB2 commands used in this report, please refer to your DB2/6000 reference manuals or ask your Database Administrator for assistance.*

*For detailed information on the SAS procedures PROC DBLOAD and PROC SQL PASS-THROUGH for DB2/6000, reference the following manuals:*

*SAS/ACCESS Software for Relational Databases Reference, Version 6 (#55144)*

*SAS/ACCESS Software Changes and Enhancements, SQL Procedure Pass-Through Facility, Version 6 (#55237)*

*SAS Software Changes and Enhancements, Release 6.11 (# 55300)*

*SAS Technical Report, Append Capability for PROC DBLOAD (TS-347)*

*Getting Started with SAS/ACCESS Software, Version 6 (# 55103)*

# SAS/ACCESS INTERFACE TO DB2/6000 SUPPORT ADDENDUM

## 6.07 PLATFORMS

<u>Platform</u>	<u>DB2/6000</u>
1. SUN4	N/A
2. HPU8	N/A
3. AIXR	N/A

## 6.09 PLATFORMS

<u>Platform</u>	<u>DB2/6000</u>
1. SUN4	N/A
2. SOL2	N/A
3. HPU8	N/A
4. AIXR	TS042 * SQL passthrough

## 6.10 PLATFORMS

<u>Platform</u>	<u>DB2/6000</u>
1. Alpha/OSF	N/A
2. MABI	
- SGI	N/A
- Pyramid	N/A
3. IABI	
- NCR	N/A
- Sequent	N/A

## 6.11 PLATFORMS

<u>Platform</u>	<u>DB2/6000</u>
1. SUN4 & SOL2	N/A
2. HPU8	N/A
3. AIXR	TS020 *SQL passthrough *DBLOAD
4. Digital UNIX	N/A
5. MABI	
- SGI	N/A
- Pyramid	N/A
6. IABI	
- NCR	N/A
- Sequent	N/A

## 6.12 BETA PLATFORMS

<u>Platform</u>	<u>DB2/6000</u>
1. SUN4 & SOL2	N/A
2. HPU8	N/A
3. AIXR	TS005 *SQL passthrough *DBLOAD