New Log System User's Guide

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1. Introduction

Welcome to DBMaster New Log System user's guide. In this guide, we will introduce basic information of new log system, setting dmconfig.ini keywords, output log files, and examples to help user to understand and use new log system.

1.1 What is New Log System

New log system is replacing Audit Trail System. Before 5.0 versions, DBMaster has the audit trail system at server side. But it does not record enough information and the format is not easy for us to understand what's going on in the user's environment. Because it is quite hard to maintain or enhance the audit trail system, we will provide a new log system for recording more information and more readable format. The old audit trail feature has been removed from 5.0.

The log system is used for recording the system information for user's operation. The purpose for the log system is to provide a way for DBA or support to understand what operation executed before or when the problem occurs.

1.2 What Information will be logged

This information could be used to record more information in the database for DBA or support to check what's going on in the user's environment.

Such as what operation are the database doing, the execution time of a SQL command, what SQL command are doing at user's runtime environment when problem occurs, service function, connection id, user name, statement id, login information, error argument, SYSUSER and SYSINFO, SYSTEM memory information if the memory could be detected, execution plan, input parameter's value in SQL command, extra locks information when lock time out or deadlock, etc.

1.3 New Log System Constraint

- When the log turns on, the server performance will be affected. Especially when the log level is high.

- User must make sure there is enough HD to store the server log. Or the log information will be lost after the HD is full.

- It's possible that some runtime problem will not be reproduced when the log has turn on because of the timing has been changed.

- Because this is a sever log, client or network error will not be recorded.

2. Usage of New Log System

2.1 General Description

DBMaster supplies two methods to turn new log function on.

One is setting keywords in dmconfig.ini file but should set before start database. User should set LGSVR first, then others log setting can work.

Another is calling SETSYSTEMOPTION() stored procedure, it can help user runtime start log system. The SP can set all functions of new log system.

2.2 Keywords

These keywords are used in server side and must be set before start DB.

DB_LGSVR is primary keyword for new log system. Other keywords are used to assistant setting.

2.2.1 DB_LGSVR

This keyword is used to turn on/off the server log, and specifies log level. The default is 0.

> 0 => do not log at all
>
> 1 => Log error, default error level is set in DB_LGERR
>
> 2 => Log slow operation, default time is set in DB_LGSTM
>
> 3 => Log error and slow operation
>
> 4 => Log connect, disconnect, commit rollback, SQL command, error and slow operation, etc.
>
> For whether to log SQL command or not is set in DB_LGSQL.
>
> 5 => Log all service functions include set connection option, commit, rollback operation when
>
> Function call exit to server.
>
> 6 => Log all operation when all service function call enter/exit server.

2.2.2 DB_LGDAY

This keyword specifies the number of days to keep the log files available. The expired log files would be removed by service daemon which is set by **DB_STSVR**. The default value is 30.

0 => filenames of log system does not include date.

1~365 => the setting of **DB_LGFNO** will be ignored.

2.2.3 DB_LGDIR

The keyword specifies the server log's directory where output log files reside. The default is 'Database Directory\lgdir' in windows platform and 'Database Directory/lgdir' in Linux platform.

2.2.4 DB_LGERR

The keyword is to set logged error level when only need to log error when LGSVR is 1-4. The default is 3.

> 0 => Log when there's core dumped or DB crash error (rc >30000)
>
> 1 => Log when there's disconnect error or DB crash error (rc >20000)
>
> 2 => Log when there's abort, disconnect or DB crash error (rc >10000)
>
> 3 => Log when there's normal, abort, disconnect or DB crash error (rc >100)
>
> 4 => Log when there's warning or any error (rc > 0)

2.2.5 DB_LGSTM

The keyword is to set the time for logging when only need to log slow statement when LGSVR is 2, 3 or 4. Unit is second. The default is 5 sec.

When DB_LGSTM = 6, it means when execution time of a SQL command is longer than 6 seconds, DBMaster will see the SQL command as a slow statement, so the SQL command will be logged when user need to log slow statement. DBMaster will log all show statements.

2.2.6 DB_LGPLN

The keyword is to set whether to log execution plan for select, update or delete statement. The default is 0.

> 0 => do not log execution plan
>
> 1 => log execution plan

2.2.7 DB_LGSYS

The keyword is to set what information will be logged when LGSVR is on. The default is 0.

If the LGSYS is turned on, more comma separated value will be logged as in the log file.

> 0 => Log execution time, rc, service function, connection_id, user_name, statement id, login information, error argument, sql statement.
>
> 1 => Log all the information as LGSYS = 0 and log the SYSUSER and SYSINFO information.
>
> 2 => Log all the information as LGSYS = 1 and log the SYSTEM memory information if the memory could be detected.

2.2.8 DB_LGZIP

This keyword is used to packing/zipping the need of closed log files would be necessary in order to save some storage. The default value is 0.

0 => packing or zipping the need of closed log files.

1 => not packing or zipping the need of closed log files.

2.2.9 DB_LGFSZ

The keyword is to set the file size of the log. The unit is MB. The default is 100. The valid range is 10 – 1500.

2.2.10 DB_LGFNO

The keyword is to set the number of file for log. The default is 20. The valid range is 2 – 255.

When DB_LGFNO = 10 and having generated 10 log files, then the next log file will cover with the 1st log file.

2.2.11 DB_LGSQL

The keyword is to set whether to log SQL command when LGSVR = 4. The default is 1.

> 0 => do not log SQL command when LGSVR = 4.
>
> 1 => log the SQL command when LGSVR = 4.

2.2.12 DB_LGPAR

The keyword is to set whether to log input parameter's value. The default is 0.

> 0 => do not log input parameter's value.
>
> 1 => log input parameter's value.
>
> 2 => log input parameter's value and stored procedure's executed SQL command.
>
> 3 => log trigger's SQL statement and parameter's value
>
> 4 => log both sp and trigger's SQL statement and parameter's value

Example:

```
insert into sample.employee values(?,?,?);
```

When DB_LGPAR = 0, DBMaster only record the SQL command with question mark, but we do not know input value.

When DB_LGPART =1 and log the above SQL command with question mark, DBMaster will use another log file to store input parameter's value.

2.2.13 DB_LGLCK

The keyword is to set whether to log extra lock information when lock time out or deadlock. The default is 0.

> 0 => do not log extra lock information when error code is lock time out or deadlock
>
> 1 => log extra locks time out information.

2.3 SETSYSTEMOPTION Stored Procedure

Usage of the sp:

SETSYSTEMOPTION(VARCHAR(32) option_name INPUT, VARCHAR(256) option_value INPUT)

Option_name: valid option name is

> LGSVR,LGDIR,LGERR,LGSTM,LGPLN,LGSYS,LGFSZ,LGFNO,LGSQL,LGPAR,L GLCK, and

FODIR: on-line change the system file object directory (DB_FoDir).

option_value is the new full path. Empty string, i.e. '', disables

the feature of the system file object.

option_value: valid value of each keyword.

NOTE:

Using the sp to set new log, the setting is only available in current session.

Example:

```
dmSQL> call SETSYSTEMOPTION('LGSVR', '3');
dmSQL> call SETSYSTEMOPTION('LGERR', '2');
dmSQL> call SETSYSTEMOPTION('LGSTM', '10');
```

2.4 Output Log Files

When the log has been turn on, we will record the server's operation according to log option and store the log in the LGDIR. The database server will assign the log name according to DBNAME and the log index number. When first start the log, some system information will be logged at **DBNAME.LOG**. When the log file size reaches default 100 MB byte or the size specified in LGFSZ, the log information will be logged to next log file. Ex: DBSAMPLE5_1.LOG, DBSAMPLE5_2.LOG …DBSAMPLE5_n.LOG. The log file will be written to next log file until default 20 file or the number specified in the LGFNO, and then rewrite the log from the **DBNAME_1.LOG**.

If there are other additional information to be logged when user turn on LGPLN, LGPAR, LGLCK or there's information in ERROR.LOG, it will be logged at **DBNAME_n.TXT**. The extra information's id will be recorded as INFO_connectionid_n at the OTHER_INFO field in the DBNAME_n.LOG and a title in DBNAME_n.TXT. So user can trace the additional information by this id.

The log format will be text csv format, so user can use excel viewer to check it after rename the .LOG to .csv file.

Example:

For the example in , the extra information's id is '**INFO_00924_1**'.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 15:54:18","2007/07/19 15:54:18","O",  63,0.03,"EXECUTE ",
924,"SYSADM","2007/07/19 15:54:18","local",0,,"INFO_00924_1","insert into
test(id,sqlName) values(?,?)"
```

NEWLOGSYSTEM_1.TXT:

```
INFO_00924_1 --------------------
[Parameter]: 4, 'abcdefghijk'
```

3. Samples

Create testing db with the following setting:

[NewLogSystem]

DB_DBDIR = D:\NEWLOGSYSTEM

DB_FODIR = D:\NEWLOGSYSTEM\FO

DB_PTNUM = 2455

DB_SVADR = 127.0.0.1

DB_SPLOG = D:\NEWLOGSYSTEM\SP

DB_LBDIR = D:\NEWLOGSYSTEM\UDF

DB_USRFO = 1

3.1 DB_LGSVR

3.1.1 DB_LGSVR = 1

3.1.1.1 Usage

One Method:

> DB_LGSVR = 1

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '1');
```

3.1.1.2 Function

Log error, default error level is set in DB_LGERR; This sample is to log error code > 100. (Because the DB_LGERR default is 3).

3.1.1.3 Run SQL Script

Please refer to chapter 4.1, "SQL Script".

3.1.1.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM.LOG:

```
Database [NEWLOGSYSTEM] begin trace at 2007/07/19 14:55:38
DBMAKER 5.0.0 (#16301, 20070718)
CREATE_DB_TIME:        2007/07/19 14:52:46
START_DB_TIME:         2007/07/19 14:54:44
```

```
LCODE:                      3
FILE_VERSION:               5.00
NUM_PAGE_BUF:               2000
DB_PAGE_SIZE:               8192
NUM_JOURNAL_FILE:           1
NUM_JOURNAL_BLOCKS:         16000
NUM_MAX_HARD_CONNECT:       240
NUM_MAX_SOFT_CONNECT:       240
DDB_MODE:                   OFF
BACKUP_MODE:                NON-BACKUP
USER_FO_MODE:               ON
READ_ONLY_MODE:             OFF
FRAME_SIZE:                 32768
MAX_ITT_SIZE:               107085824
TOTAL_MEMORY:               535543808
TOTAL_FREE_MEMORY:          99774464
TOTAL_SWAP_MEMORY:          1550716928
TOTAL_FREE_SWAP_MEMORY:     1097203712
Database [NEWLOGSYSTEM] end trace at 2007/07/19 14:56:17
```

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 14:04:46","2007/07/19 14:04:46","X", 6018,0.00,"PREPARE
",2240,"SYSADM","2007/07/19 14:04:46","local",0,": INT [lxparser 327], 0, 0, 0",,"create
table int(a int)"

"2007/07/19 14:04:46","2007/07/19 14:04:46","X",20916,0.01,"CONNECT ",-1,"","1970/01/01
08:00:00","",-1,", 5 users connecting now [dbconn.c 233], 5, 0, 0",,"connect db"

"2007/07/19 14:04:46","2007/07/19 14:04:46","X", 6521,0.00,"EXECUTE
",2240,"SYSADM","2007/07/19 14:04:46","local",0,": T1 [exddl1.c 417], 0, 0, 0",,"drop table
t1"

"2007/07/19 14:04:46","2007/07/19 14:04:46","X", 6521,0.00,"EXECUTE
",2240,"SYSADM","2007/07/19 14:04:46","local",0,": T2 [exddl1.c 417], 0, 0, 0",,"drop table
t2"

"2007/07/19 14:04:46","2007/07/19 14:04:46","X", 6521,0.00,"EXECUTE
",2240,"SYSADM","2007/07/19 14:04:46","local",0,": T3 [exddl1.c 417], 0, 0, 0",,"drop table
t3"

"2007/07/19 14:04:46","2007/07/19 14:04:46","X", 6521,0.00,"EXECUTE
",2240,"SYSADM","2007/07/19 14:04:46","local",0,": T4 [exddl1.c 417], 0, 0, 0",,"drop table
t4"
```

3.1.1.5 Analyze Output Log files

When set DB_LGSVR = 1 to log errors, new log system will refer to DB_LGSYS (the default is 0)
and DB_LGERR (the default is 3) to decide log information.

So it only logs errors (rc > 100), error 6018 and error 20916 and error 6521.

3.1.2 DB_LGSVR = 2

3.1.2.1 Usage

One Method:

DB_LGSVR = 2

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '2');
```

3.1.2.2 Function

The sample is to log slow query > 5 sec.

3.1.2.3 Run SQL Script

Please refer to chapter 4.2, "slow_sql_data.sql".

3.1.2.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 15:01:40","2007/07/19 15:01:29","S",  41,10.65,"EXECUTE ",
2616,"SYSADM","2007/07/19 15:01:25","local",0,,,"select * from t1 a left outer join (t2 b,t3
c, t4 d) where (a.c1=b.c1) and (a.c1 = c.c1) and (a.c1=d.c1) and a.c2='ABC'"
```

3.1.2.5 Analyze Output Log files

When set DB_LGSVR = 2 only to log slow operation, new log system will refer to DB_LGSYS (the default is 0) and DB_LGERR (the default is 3) and DB_LGSTM (the default is 5 second) to decide log information.

Because execution time of the SQL command is 10.65 second (> 5 second), DBMaster sees the SQL command as a slow operation. In this SQL script, there is only one slow command, so new log system logs the slow command.

3.1.3 DB_LGSVR = 3

3.1.3.1 Usage

One Method:

DB_LGSVR = 3

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '3');
```

3.1.3.2 Function

The sample is to log error code > 100 and slow query > 5 sec.

3.1.3.3 Run SQL Script

Please refer to chapter 4.1, "SQL Script".

3.1.3.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 15:11:23","2007/07/19 15:11:23","X", 6018,0.04,"PREPARE ",
2616,"SYSADM","2007/07/19 15:11:23","local",0,": INT [lxparser 327], 0, 0, 0",,"create
table int(a int)"

"2007/07/19 15:11:23","2007/07/19 15:11:23","X",20916,0.01,"CONNECT ",
-1,"","1970/01/01 08:00:00","",-1,", 5 users connecting now [dbconn.c 239], 5, 0,
0",,"connect db"
```

```
"2007/07/19 15:11:37","2007/07/19 15:11:27","S",  41,10.45,"EXECUTE ",
2616,"SYSADM","2007/07/19 15:11:23","local",0,,,"select * from t1 a left outer join (t2 b,t3
c, t4 d) where (a.c1=b.c1) and (a.c1 = c.c1) and (a.c1=d.c1) and a.c2='ABC'"
```

3.1.3.5 Analyze Output Log files

When set DB_LGSVR = 3, new log system not only logs errors, but also logs slow operation. So DB_LGSVR =3 is combination of DB_LGSVR =1 and DB_LGSVR =2.

So it logs error 6018, error 20916, and the slow SQL command.

3.1.4 DB_LGSVR = 4

3.1.4.1 Usage

One Method:

DB_LGSVR = 4

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '4');
```

3.1.4.2 Function

The sample is to log connect, disconnect, commit, rollback, any operation that is related to a sql statement, error code > 100 and slow query > 5 sec.

3.1.4.3 Run SQL Script

Please refer to chapter 4.1, "SQL Script".

3.1.4.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG: please refer to chapter 4.3, "When DB_LGSVR = 4".

3.1.4.5 Analyze Output Log files

When set DB_LGSVR = 4, new log system will not only log information when DB_LGSVR = 3, but also log other information, and refer to DB_LGSQL (the default is 1).

So it logs all SQL commands, errors, slow operation, etc.

3.1.5 DB_LGSVR = 5

3.1.5.1 Usage

One Method:

DB_LGSVR = 5

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '5');
```

3.1.5.2 Function

The sample is to log all server function of calling server when enter server.

3.1.5.3 **Run SQL Script**

Please refer to chapter 4.1, "SQL Script".

3.1.5.4 **Check Output Log Files**

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG: please refer to chapter 4.4, "When DB_LGSVR = 5".

3.1.6 DB_LGSVR = 6

3.1.6.1 **Usage**

One Method:

DB_LGSVR = 6

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '6');
```

3.1.6.2 **Function**

The sample is to log all server function of calling server when enter/exit server.

3.1.6.3 **Run SQL Script**

Please refer to chapter 4.1, "SQL Script".

3.1.6.4 **Check Output Log Files**

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG: please refer to chapter 4.5, "When DB_LGSVR = 6 ".

3.2 DB_LGSYS

3.2.1 DB_LGSYS = 1

3.2.1.1 **Usage**

One Method:

DB_LGSVR = 1

DB_LGSYS = 1

Or another Method:

```
Call SETSYSTEMOPTION('LGSVR', '1');
Call SETSYSTEMOPTION('LGSYS', '1');
```

3.2.1.2 **Function**

The sample is to log error code > 100. And it logs more information than as LGSYS = 0(default value), it also logs the SYSUSER and SYSINFO information. You can find the first line has more columns in log file.

3.2.1.3 **Run SQL Script**

Please refer to chapter 4.1, "SQL Script".

3.2.1.4 **Check Output Log Files**

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,NUM_SCAN,NUM_INSERT,NUM_UPDATE,NUM_DELETE,NUM_TRANX,NUM_IDX_SPLIT,NUM_PAGE_
COMPRESS,NUM_PHYSICAL_READ,NUM_PHYSICAL_WRITE,NUM_LOGICAL_READ,NUM_LOGICAL_WRITE,NUM_JN
L_BLK_READ,NUM_JNL_BLK_WRITE,NUM_JNL_REC_WRITE,NUM_JNL_FRC_WRITE,NUM_JNR_BLOCK_FREE,CUR
RENT_JOURNAL_FN,CURRENT_JOURNAL_BN,NUM_STARTED_TRANX,NUM_COMMITED_TRANX,NUM_ABORTED_TRA
NX,NUM_CHECKPOINT,NUM_COMMIT_WAITER,NUM_ROW_LOCK_UPG,NUM_PAGE_LOCK_UPG,NUM_LOCK_TIMEOUT
,NUM_LOCK_WAIT,NUM_LOCK_REQUEST,NUM_DEADLOCK,NUM_CONNECT,NUM_PEAK_CONNECT,NUM_SQL_SELEC
T,NUM_SQL_INSERT,NUM_SQL_UPDATE,NUM_SQL_DELETE,NUM_SQL_PREPARE,NUM_SQL_EXECUTE,NUM_SQL_
EXEDIRECT,NUM_SQL_FETCH,SYSINFO_RESET_TIME,FREE_DCCA_SIZE,CURRENT_ITT_SIZE,ERROR_ARG,OT
HER_INFO,SQL_CMD

"2007/07/19 18:45:36","2007/07/19 18:45:36","X", 6018,0.00,"PREPARE ",
952,"SYSADM","2007/07/19
18:45:36","local",0,17,2,0,3,7,0,1,102,1,689,9,13,29,11,2,15965,0,15718,16,10,3,1,0,0,0
,0,0,227,0,3,3,0,0,0,0,3,3,0,0,"2007/07/19 18:45:28",1547352,0,": INT [lxparser 327], 0,
0, 0",,"create table int(a int)"

"2007/07/19 18:45:36","2007/07/19 18:45:36","X",20916,0.01,"CONNECT ",
-1,"","1970/01/01
08:00:00","",-1,0,0,0,0,0,0,2,109,1,796,31,13,67,44,8,15927,0,15756,38,27,3,1,0,0,0,0,0
,354,0,8,8,1,5,0,0,8,10,0,1,"2007/07/19 18:45:28",1544216,0,", 5 users connecting now
[dbconn.c 239], 5, 0, 0",,"connect db"
```

3.3 DB_LGERR

3.3.1 DB_LGERR = 1

3.3.1.1 **Usage**

One Method:

DB_LGSVR = 1

DB_LGERR = 1

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '1');
Call SETSYSTEMOPTION('LGERR', '1');
```

3.3.1.2 **Function**

The sample is to log the error code > 20000.

3.3.1.3 **Run SQL Script**

Please refer to chapter 4.1, "SQL Script".

3.3.1.4 **Check Output Log Files**

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD
```

```
"2007/07/19 15:37:00","2007/07/19 15:37:00","X",20916,0.01,"CONNECT ",
-1,"","1970/01/01 08:00:00","",-1,", 5 users connecting now [dbconn.c 239], 5, 0,
0",,"connect db"
```

3.3.1.5 Analyze Output Log files

When setting DB_LGSVR =1 and DB_LGERR =1, new log system only logs errors (rc >20000).so it logs error 20916.

3.3.2 DB_LGERR = 4

3.3.2.1 Usage

One Method:

DB_LGSVR = 1

DB_LGERR = 4

Another Method:

```
Call SETSYSTEMOPTION('LGSVR', '1');
Call SETSYSTEMOPTION('LGERR', '4');
```

3.3.2.2 Function

The sample is to log the error code > 0.

3.3.2.3 Run SQL Script

Please refer to <u>chapter 4.1, "SQL Script"</u>.

3.3.2.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG and NEWLOGSYSTEM_1.LOG the two files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 15:40:13","2007/07/19 15:40:13","O",  76,0.00,"EXECUTE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"grant connect to user1"

"2007/07/19 15:40:13","2007/07/19 15:40:13","X", 6018,0.01,"PREPARE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,": INT [lxparser 327], 0, 0, 0",,"create table
int(a int)"

"2007/07/19 15:40:13","2007/07/19 15:40:13","O",  63,0.01,"EXECUTE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"insert into test(id,sqlName)
values(2,'abcdefghijk')"

"2007/07/19 15:40:13","2007/07/19 15:40:13","O",  63,0.04,"EXECUTE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"insert into test(id,sqlName) values(?,?)"

"2007/07/19 15:40:13","2007/07/19 15:40:13","O",  41,0.01,"EXECUTE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"select * from test"

"2007/07/19 15:40:13","2007/07/19 15:40:13","O",  41,0.00,"EXFETCH ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"select * from test"

"2007/07/19 15:40:13","2007/07/19 15:40:13","X",20916,0.01,"CONNECT ",
-1,"","1970/01/01 08:00:00","",-1,", 5 users connecting now [dbconn.c 239], 5, 0,
0",,"connect db"

"2007/07/19 15:40:27","2007/07/19 15:40:17","O",  41,10.50,"EXECUTE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"select * from t1 a left outer join (t2 b,t3
c, t4 d) where (a.c1=b.c1) and (a.c1 = c.c1) and (a.c1=d.c1) and a.c2='ABC'"

"2007/07/19 15:40:27","2007/07/19 15:40:27","O",  41,0.00,"EXFETCH ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"select * from t1 a left outer join (t2 b,t3
c, t4 d) where (a.c1=b.c1) and (a.c1 = c.c1) and (a.c1=d.c1) and a.c2='ABC'"

"2007/07/19 15:40:27","2007/07/19 15:40:27","O",   0,0.01,"EXECUTE ",
344,"SYSADM","2007/07/19 15:40:13","local",0,,,"rollback to point1"
```

3.3.2.5 Analyze Output Log files

When setting DB_LGSVR =1 and DB_LGERR =4, new log system logs warning or any error (rc > 0).so it logs warning 63, warning 76, error 6018 and error 20916.

3.4 DB_LGPAR

3.4.1 DB_LGPAR = 1

3.4.1.1 Usage

One Method:

        DB_LGSVR = 1

        DB_LGERR = 4

        DB_LGPAR = 1

Or another Method:

```
Call SETSYSTEMOPTION('LGSVR', '1');
Call SETSYSTEMOPTION('LGERR', '4');
Call SETSYSTEMOPTION('LGPAR', '1');
```

3.4.1.2 Function

The sample is to log the error code > 0 and input parameter's value.

3.4.1.3 Run SQL Script

Please refer to chapter 4.1, "SQL Script".

3.4.1.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG, NEWLOGSYSTEM_1.LOG and NEWLOGSYSTEM_1.TXT the three files.

NEWLOGSYSTEM_1.LOG: content same with chapter 3.2.2.

```
…
"2007/07/19 15:54:18","2007/07/19 15:54:18","O",  63,0.03,"EXECUTE ",
924,"SYSADM","2007/07/19 15:54:18","local",0,,"INFO_00924_1","insert into
test(id,sqlName) values(?,?)"
…
```

NEWLOGSYSTEM_1.TXT:

```
INFO_00924_1 --------------------
[Parameter]: 4, 'abcdefghijk'
```

3.4.1.5 Analyze Output Log files

The error command (insert into test(id,sqlName) values(?,?)) has question mark, we only know the error command, but do not know detailed values. So it generates a new **NEWLOGSYSTEM_1.TXT file** to store input parameter's value.

INFO_00924_1: to search **NEWLOGSYSTEM_1.LOG** to locate the related command.

[Parameter]: symbol parameter's value.

3.5 DB_LGPLN

3.5.1 DB_LGPLN = 1

3.5.1.1 Usage

One Method:

DB_LGSVR = 2

DB_LGPLN = 1

Or another Method:

```
Call SETSYSTEMOPTION('LGSVR', '2');
Call SETSYSTEMOPTION('LGPLN', '1');
```

3.5.1.2 Function

The sample is to log slow query > 5 sec and execution plan of slow query.

3.5.1.3 Run SQL Script

Please refer to chapter 4.1, "SQL Script".

3.5.1.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG, NEWLOGSYSTEM_1.LOG and NEWLOGSYSTEM_1.TXT the three files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_ADDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 16:35:09","2007/07/19 16:34:58","S",  41,10.68,"EXECUTE ",
2256,"SYSADM","2007/07/19 16:34:54","local",0,,"INFO_02256_1","select * from t1 a left
outer join (t2 b,t3 c, t4 d) where (a.c1=b.c1) and (a.c1 = c.c1) and (a.c1=d.c1) and a.c2='ABC'"
```

NEWLOGSYSTEM_1.TXT:

```
INFO_02256_1 --------------------
[Dump Plan]:
{ON Block 0}
ON Type   : JOIN

[PL Block 0]
Method    : Outer Join
Type      : Nested Join
Factors   : (1) T1.C1 = T2.C1
        : (2) T1.C1 = T3.C1
        : (3) T1.C1 = T4.C1
I/O Cost  : 0.0
CPU Cost  : 0.0
Sub Cost  : 0.0
Result Rows: 0.0
Sub Block 1: [PL Block 1]
Sub Block 2: [PL Block 2]

[PL Block 1]
Method    : Scan
```

```
Table Name : T1
Type      : Table Scan
Order     : <none>
Factors   : (4) T1.C2 = 'ABC'
I/O Cost  : 5.0
CPU Cost  : 25.3
Sub Cost  : 0.0
Result Rows: 10.0

[PL Block 2]
Method    : Join
Type      : Nested Join
Factors   : <none>
I/O Cost  : 5005005.0
CPU Cost  : 25300300.0
Sub Cost  : 0.0
Result Rows: 1000000000.0
Sub Block 1: [PL Block 3]
Sub Block 2: [PL Block 4]

[PL Block 3]
Method    : Join
Type      : Nested Join
Factors   : <none>
I/O Cost  : 5005.0
CPU Cost  : 25300.3
Sub Cost  : 0.0
Result Rows: 1000000.0
Sub Block 1: [PL Block 5]
Sub Block 2: [PL Block 6]

[PL Block 5]
Method    : Scan
Table Name : T2
Type      : Table Scan
Order     : <none>
Factors   : <none>
I/O Cost  : 5.0
CPU Cost  : 25.3
Sub Cost  : 0.0
Result Rows: 1000.0

[PL Block 6]
Method    : Scan
Table Name : T3
Type      : Table Scan
Order     : <none>
Factors   : <none>
I/O Cost  : 5.0
CPU Cost  : 25.3
Sub Cost  : 0.0
```

```
Result Rows: 1000.0


[PL Block 4]
Method   : Scan
Table Name : T4
Type     : Table Scan
Order    : <none>
Factors  : <none>
I/O Cost : 5.0
CPU Cost : 25.3
Sub Cost : 0.0
Result Rows: 1000.0
```

3.6 DB_LGLCK

3.6.1 DB_LGLCK = 1

3.6.1.1 Usage

One Method:

> DB_LGSVR = 1
>
> DB_LGLCK= 1

Or another Method:

```
Call SETSYSTEMOPTION('LGSVR', '1');
Call SETSYSTEMOPTION('LGLCK', '1');
```

3.6.1.2 Function

The sample is to log error code > 100 and extra lock time out information.

3.6.1.3 Run SQL Script

```
connect to newlogsystem sysadm;
drop table test_lock;
create table test_lock(num int,sqlName char(10));
set autocommit off;
insert into test_lock values(1,'insert');
USE 2;
connect to newlogsystem sysadm;
update test_lock set sqlName = 'update';
disconnect;
use 1;
```

3.6.1.4 Check Output Log Files

In 'D:\NEWLOGSYSTEM\lgdir' directory: NEWLOGSYSTEM.LOG, NEWLOGSYSTEM_1.LOG and NEWLOGSYSTEM_1.TXT the three files.

NEWLOGSYSTEM_1.LOG:

```
LOG_TIME,BEG_TIME,STATE,RETCODE,EXE_TIME,SV_FUNC,CONNECT_ID,USERNAME,LOGIN_TIME,LOGIN_A
DDR,STMT_ID,ERROR_ARG,OTHER_INFO,SQL_CMD

"2007/07/19 17:23:49","2007/07/19 17:23:49","X", 6521,0.00,"EXECUTE ",
2256,"SYSADM","2007/07/19 17:23:49","local",0,": TEST_LOCK [exddl1.c 420], 0, 0, 0",,"drop
table test_lock"
```

```
"2007/07/19 17:23:54","2007/07/19 17:23:49","X", 1102,5.01,"EXECUTE ",
2152,"SYSADM","2007/07/19 17:23:49","local",0,": Object ID : 2.2.0 ,Connection ID : 2256,
LKMode : X  .NONE, LKStatus : GRANTED, Command : [EXIT] insert into test_lock
values(1,'insert') [lkget.c 688], 501507, 0, 0","INFO_02152_1","update test_lock set
sqlName = 'update'"
```

NEWLOGSYSTEM_1.TXT:

```
INFO_02152_1 --------------------

[ERR_LK_TIMEOUT]:: Object ID : 2.2.0 ,Connection ID : 2256, LKMode : X  .NONE, LKStatus :
GRANTED, Command : [EXIT] insert into test_lock values(1,'insert')
```

4. Appendix

4.1 SQL Script

The following script is used in chapter 3.1.1, "DB_LGSVR = 1",

chapter 3.1.3, "DB_LGSVR = 3",

chapter 3.1.4, "DB_LGSVR = 4",

chapter 3.1.5, "DB_LGSVR = 5",

chapter 3.1.6, "DB_LGSVR = 6",

chapter 3.2.1, "DB_LGSYS = 1",

chapter 3.3.1, "DB_LGERR = 1",

chapter 3.3.2, "DB_LGERR = 4",

chapter 3.4.1, "DB_LGPAR = 1",

and chapter 3.5.1, "DB_LGPLN = 1".

```
connect to newlogsystem sysadm;


//Warning(76)
grant connect to user1;
grant connect to user1;
revoke connect from user1;


//Error(6018)
create table int(a int);


create table test(num serial(1),id int,sqlName char(10));
insert into test(id,sqlName) values(1,'abcde');
//WARNING(63)
insert into test(id,sqlName) values(2,'abcdefghijk');
insert into test(id,sqlName) values(?,?);
3,'abc';
4,'abcdefghijk';
5,'abc';
end;
select * from test;


//Error20916
use 2;
connect to newlogsystem sysadm;
use 3;
connect to newlogsystem sysadm;
```

```
use 4;
connect to newlogsystem sysadm;
use 5;
connect to newlogsystem sysadm;
use 6;
connect to newlogsystem sysadm;
use 7;
connect to newlogsystem sysadm;
use 2;
disconnect;
use 3;
disconnect;
use 4;
disconnect;
use 5;
disconnect;
use 6;
disconnect;

use 1;
//To test slow SQL, run slow_sql_data.sql to prepare data
//please refer to the script in Appendix
run 'D:\slow_sql_data.sql';
select * from t1 a left outer join (t2 b,t3 c, t4 d) where (a.c1=b.c1) and (a.c1 = c.c1) and (a.c1=d.c1) and a.c2='ABC';

//To log commit,rollback command
set autocommit off;
insert into test(id,sqlName) values(6,'commit');
savepoint point1;
insert into test(id,sqlName) values(7,'rollback');
rollback to point1;
commit;
drop table test;
commit;
```
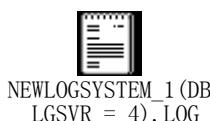
4.2 slow_sql_data.sql

The sql script is used in chapter 3.1.2, "DB_LGSVR = 2".

slow_sql_data.sql

4.3 When DB_LGSVR = 4

The file is output log file of chapter 3.1.4, "DB_LGSVR = 4".

NEWLOGSYSTEM_1(DB
_LGSVR = 4).LOG

4.4 When DB_LGSVR = 5

The file is output log file of chapter 3.1.5, "DB_LGSVR = 5".

NEWLOGSYSTEM_1(DB
_LGSVR = 5).LOG

4.5 When DB_LGSVR = 6

The file is output log file of chapter 3.1.6, "DB_LGSVR = 6".

NEWLOGSYSTEM_1(DB
_LGSVR = 6).LOG