Oracle® CODASYL DBMS

Release Notes

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ORACLE®

Oracle CODASYL DBMS Release Notes, Release 7.1.3.0

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Preface

Purpose of This Manual

The Oracle CODASYL DBMS release 7.1.3.0 release notes summarize new features, software corrections, restrictions, workarounds, and known problems. These release notes cover Oracle CODASYL DBMS for OpenVMS Alpha.

Intended Audience

This document is intended for users responsible for:

- System management
- Database administration
- Application programming

Document Structure

This document consists of three chapters:

Chapter 1	Describes installation requirements and location of documents
Chapter 2	Describes corrected software errors
Chapter 3	Describes known problems, restrictions, and workarounds, as well as documentation errors and omissions

Conventions

Oracle CODASYL DBMS is often referred to as DBMS.

The following conventions are used in this document:

word	A lowercase word in a format example indicates a syntax element that you supply.
[ ]	Brackets enclose optional clauses from which you can choose one or none.
{ }	Braces enclose clauses from which you must choose one alternative.

. . .

A horizontal ellipsis means you can repeat the previous item.

.
.
.

A vertical ellipsis in an example means that information not directly related to the example has been omitted.

1
Installation and Documentation

This chapter contains installation and documentation information for Oracle CODASYL DBMS release 7.1.3.0.

1.1 Requirements

This version of Oracle CODASYL DBMS supports OpenVMS Alpha version 8.3.

The following condition must be met in order to install this software:

- OpenVMS Alpha version 7.2 or later

1.2 Installation of Oracle CODASYL DBMS Software

Please refer to the *CODASYSL DBMS V7.1 Installation Guide* for detailed Oracle CODASYL DBMS installation instructions. Oracle strongly recommends that you read the installation guide before attempting an installation.

To extract either the PostScript (PS) or text (TXT) version of the installation guide from the kit, use one of the following commands:

```
$ BACKUP <device>:DBM07130A071.A/SAVE/SEL=DBM071_INSTALL_GDE.PS
$ BACKUP <device>:DBM07130A071.A/SAVE/SEL=DBM071_INSTALL_GDE.TXT
```

The release 7.1 installation guide is available on MetaLink and OTN in Adobe Acrobat PDF format.

1.3 Documentation in Adobe Acrobat Format

You can view the documentation in Adobe Acrobat format using the Acrobat Reader, which allows anyone to view, navigate, and print documents in the Adobe Portable Document Format (PDF). For information about obtaining a free copy of Acrobat Reader and for information on supported platforms, see the Adobe Web site at:

```
http://www.adobe.com
```

The Oracle CODASYL DBMS and Hot Standby documentation in Adobe Acrobat format is available on MetaLink and OTN.

2
Problems Corrected

This chapter describes software errors corrected in Oracle CODASYL DBMS release 7.1.3.0.

2.1 Problem with Remote Access and FETCH..USING

A problem has been uncovered with Oracle CODASYL DBMS when using remote database access with either DBQ or DML applications. If you attempt to FETCH a record via a USING clause, the fetch may fail with a DBM-F-END condition, even though the record does exist.

The problem will ONLY occur if one of the data items specified in the USING clause is the last data item defined in that record.

The error does not occur with local database access or with remote access when using the WHERE clause.

For example, given the following schema:

```
AREA NAME IS A1

RECORD NAME IS R1
    WITHIN A1
    ITEM NAME IS I1
        TYPE IS CHARACTER 5
    ITEM NAME IS I2
        TYPE IS CHARACTER 5
    ITEM NAME IS I3
        TYPE IS CHARACTER 5

SET NAME IS ALL_R1
    OWNER IS SYSTEM
    MEMBER IS R1
        INSERTION IS AUTOMATIC
            RETENTION IS FIXED
        ORDER IS SORTED BY
                    ASCENDING I3
```

and assuming that there is an R1 record with the following values:

```
I1 = 'AAAAA'
I2 = 'BBBBB'
I3 = 'CCCCC'
```

The following remote query attempting to fetch record R1 will fail:

```
dbq> bind dbmfetrmtdb
dbq> ready
dbq> set noprompt
dbq> move 'CCCCC' TO I3
dbq> fetch first within ALL_R1 using I3
%DBM-F-END, end of collection
```

whereas, the same logical query using a WHERE clause will succeed:

```
dbq> fetch first within ALL_R1 where I3 eq 'CCCCC'
I1 = AAAAA
I2 = BBBBB
I3 = CCCCC
```

This problem has now been fixed. No application programming changes are required.

2.2 Area File not Renamed after DBO/MODIFY/RESTRUCTURE

The Oracle CODASYL DBMS reload utility (DBO/MODIFY/RESTRUCTURE) moves database records from a specified target area to a new area.

In versions of DBMS prior to V7.0, the default behavior was to create the new storage area with the same filename (and in the same directory) as the target original area, with an incremented file version number. Note: only offline reload is available in pre-V70 versions.

Starting with DBMS v7.0, these defaults were modified to ensure that the new storage area filename was unique by attempting to append an "_A" (OR "_B", etc) to the storage area name. This was done as part of the work to support online reload (DBO/MODIFY/RESTRUCTURE/ONLINE), where the reload could be stopped and restarted in the middle of execution.

The idea was to make sure that there was no confusion between the original area and the new area, if the reload were stopped for any reason, and to make sure that certain file actions, such as a $PURGE, would not delete the original area prior to reload completion.

If you wish to retain the old behavior, include the /FILE= qualifier on the DBO/MODIFY/RESTRUCTURE command and specify the original storage area filename as the parameter. This qualifier should be included on the restructure operation that performs the EXECUTE phase for offline reload, or the PREPARE phase in the case of online reload.

For example, assume that you wished to reload the BUY area in the PARTS database.

In pre-V70 offline reloads, the default would be to create a storage area, BUY.DBS;2 (assuming that BUY.DBS;1 was the original area filename). In V70 AND later, the default would be to create BUY_A.DBS;1.

To maintain the old behavior, issue DBO/MODIFY/RESTRUCTURE PARTS BUY/FILE=BUY. Note that you could also specify the /DIRECTORY qualifier to have the new storage area created in a new directory.

To modify the storage area file name of a previously reloaded area, you can rename the file, then use the DBO/ALTER utility and execute:

```
DBALTER> DEPOSIT FILE <area> SPECificaion <new-filename>
```

2.3 DBO/SHOW STATISTICS Hot Standby Statistics State Display Field

Previously, when using the TCP/IP network transport with the Hot Standby feature, the DBO /SHOW STATISTICS "Hot Standby Statistics" display "State:" field could overwrite the "UserSync:" heading as in the following example:

```
Node: HSVMS  (1/1/16)  Oracle CODAYSL DBMS V7.1-24 Perf. Monitor 18-JUL-2006 06:17:59.97
Rate: 3.00 Seconds           Hot Standby Statistics         Elapsed: 00:07:28.63
Page: 1 of 1  $MYDISK:[MYDB]PARTS.ROO;1  Mode: Online
--------------------------------------------------------------------------------
State: TCP/IP:72     rSync: Cold Current.Msg: 1       Cl Mstr.AIJ: 1:2
LagTime: 00:00:00 AutoSync: Cold Stalled.Msg: none     1 Stby.AIJ: 1:2
Stby.DB: $MYDISK:[MYDB_STANDBY]PARTS.
```

The line starting with "State:" partly overwrites "UserSync:".

This problem has been corrected.

2.4 File-System Caching Avoided For DBO /COPY, /MOVE, /BACKUP/MULTI and /RESTORE/MULTI Access To Database

In order to reduce CPU consumption and XFC spinlock contention and to help avoid "thrashing" the file system cache and to streamline database file read and write operations during DBO /COPY, /MOVE, /BACKUP and /RESTORE functions, caching by the operating system is disabled when reading from or writing to the database files. There is no effect on caches implemented in storage devices or controllers.

Testing on various configurations indicates that, in general, avoiding the system's XFC cache for these database operations results in better over-all performance as balanced between CPU and IO costs.

2.5 DBO/BACKUP/AFTER Ignores /EDIT_FILENAME When Backup Filespec Omitted

When a **DBO/BACKUP/AFTER** command was issued, if the **/EDIT_FILENAME** qualifier was included but no output filename was given, the default journal filename would be used and the contents of the **/EDIT_FILENAME** qualifier were ignored. For example:

```
$ DBO/BACKUP/AFTER/LOG -
  /EDIT=("_",VNO,"_",YEAR,MONTH,DAY_OF_MONTH,"_QP") -
  DBM$DATABASE ""
.
.
.
%DBO-I-LOGCREBCK, created backup file DEV:[DIR]JOURNAL_1.AIJ;1
```

In the above example, no output filename was specified, that is, "" was given as the output file. The journal that was being backed up had the filename "JOURNAL_1". The backup filespec constructed by DBO should have been "JOURNAL_1_0_20060829.AIJ", but the contents of the **/EDIT_FILENAME** qualifier were not incorporated in the output filename.

This problem can be avoided by explicitly providing the backup output filename in the backup command.

This problem has been corrected.

2.6 Processes Don't Always Terminate After Monitor Terminates

When the Oracle CODASYL DBMS monitor process terminates abnormally all user processes that are attached to databases on that node should immediately terminate. However, there were cases where that didn't happen, and those user processes would continue to access Oracle CODASYL DBMS resources after the monitor failed. Consider the following example.

User 1, node 1:

```
DBQ> BIND PARTS
```

User 2, node 2:

```
DBQ> BIND PARTS
```

User 3, node 1:

```
$ STOP/ID={pid of monitor process on node 1}
```

In the above sequence of events, the user process on node 1 should have terminated as soon as the monitor process was killed, but it remained active.

This problem can be avoided by using the **DBO/OPEN** command and manually opening databases on all nodes that will have users accessing the database.

This problem has been corrected.

2.7 Latch Hangs Possible From DBO /SHOW STATISTICS

In prior releases of Oracle CODASYL DBMS, it was possible in a very small timing window for processes running the DBO /SHOW STATISTICS command to become hung while manipulating "latches" during the database attach sequence. Depending on the exact timing and sequence of events, this process may block other users of the database.

This problem has been corrected.

2.8 LRS Shutdown Failure DBM-F-PARTDTXNERR/SYSTEM-F-NOSUCHID

A possible problem with the Oracle CODASYL DBMS Hot Standby feature has been identified. If the OpenVMS $GETGTI system service returns a status value of SS$_NOSUCHID, the LRS process could be unable shutdown cleanly. This could result in an inconsistent standby database.

This problem has been corrected. The LRS process now treats a returned SS$_ NOSUCHID status the same as a SS$_NOSUCHTID status and will be handled normally and will not be cause the LRS to fail.

3

Known Problems, Workarounds, and Documentation Errors

This chapter describes known problems, restrictions, and workarounds, as well as documentation errors and omissions for Oracle CODASYL DBMS release 7.1.3.0.

3.1 AIJ Log Server Process May Loop or Bugcheck

Under unknown but extremely rare conditions, on busy databases where the After Image Journal (AIJ) Log Server process is enabled, the ALS process has been observed to enter a loop condition writing AIJ information to the .AIJ files.

In the worst case, this problem could cause all available journal files to be filled with repeating data. If no remedial action were taken, this condition could cause the database to be shut down, and the AIJ journals to be considered inaccessable.

The database is not corrupted by this problem.

Stopping and restarting the ALS process will clear the looping condition, even if the ALS process must be stopped using the STOP/ID command.

Stopping the ALS process will not impact production as AIJ writes automatically revert to the non-ALS behaviour.

In this release, the behavior has been changed so that if this problem is detected, the ALS process will automatically shut down, producing a bugcheck dump file. This will prevent any danger of filling all available journals and ensure that the dabase remains available.

ALS may be safely restarted immediately as the conditions that cause such a loop are resolved during recovery of the ALS process.

3.2 VMS$MEM_RESIDENT_USER Rights Identifier

Oracle CODASYL DBMS version 7.1 introduced additional privilege enforcement for the database or row cache qualifiers MEMORY_MAPPING=SYSTEM and LARGE_MEMORY. If a database utilizes any of these features, the user account that opens the database must be granted the VMS$MEM_RESIDENT_USER rights identifier. Also, any process attempting to change these attributes, or to convert or restore a database with these attributes enabled must also hold the same right.

Oracle recommends that the DBO/OPEN command be used when utilizing these features.

3.3 DBM$BIND_MAX_DBR_COUNT Documentation Clarification

The following is an updated description for the DBM$BIND_MAX_DBR_COUNT logical.

When an entire database is abnormally shut down (for example, due to a system failure), the database must be recovered in a node failure recovery mode. This recovery is performed by another monitor in the cluster if the database is opened on another node or is performed the next time the database is opened.

The DBM$BIND_MAX_DBR_COUNT logical name and the DBM_BIND_MAX_DBR_COUNT configuration parameter define the maximum number of database recovery (DBR) processes to be simultaneously invoked by the database monitor for each database during a node failure recovery. This logical name and configuration parameter apply only to databases that do not have global buffers enabled. Databases that utilize global buffers have only one recovery process started at a time during a node failure recovery.

In a node failure recovery situation with the Row Cache feature enabled (regardless of the global buffer state), the database monitor starts a single database recovery (DBR) process to recover the Row Cache Server (RCS) process and all user processes from the oldest active checkpoint in the database.

Per-Database Value

The DBM$BIND_MAX_DBR_COUNT logical name specifies the maximum number of database recovery processes to run at once for each database. For example, if there are 10 databases being recovered and the value for the DBM$BIND_MAX_DBR_COUNT logical name is 8, up to 80 database recovery processes would be started by the monitor after a node failure.

The DBM$BIND_MAX_DBR_COUNT logical name is translated when the monitor process opens a database. Databases must be closed and reopened for a new value of the logical to become effective.