》Fault Diagnosability Infrastructure Overview

Automatic capture of diagnostic data upon first failure

Standardized trace formats

Health checks

Incident packaging service (IPS) and incident packages

Data Recovery Advisor

SQL Test Case Builder

》About Incidents and Problems

problem=critical error=ORA-00600/ORA-07445/ORA-04031

incident=single occurrence of a problem

Alert Log

The alert log is an XML file that is a chronological log of database messages and errors. It is stored in the ADR and includes messages about the following:

Critical errors (incidents)

Administrative operations, such as starting up or shutting down the database, recovering the database, creating or dropping a tablespace, and others.

Errors during automatic refresh of a materialized view

Other database events

Trace Files, Dumps, and Core Files

Trace files, dumps, and core files contain diagnostic data that are used to investigate problems. They are stored in the ADR.

Trace Files

Each server and background process can write to an associated trace file. Trace files are updated periodically over the life of the process and can contain information on the process environment, status, activities, and errors. In addition, when a process detects a critical error, it writes information about the error to its trace file. The SQL trace facility also creates trace files, which provide performance information on individual SQL statements. You can enable SQL tracing for a session or an instance.

Trace file names are platform-dependent. Typically, database background process trace file names contain the Oracle SID, the background process name, and the operating system process number, while server process trace file names contain the Oracle SID, the string "ora", and the operating system process number. The file extension is .trc. An example of a server process trace file name is orcl\_ora\_344.trc. Trace files are sometimes accompanied by corresponding trace map (.trm) files, which contain structural information about trace files and are used for searching and navigation.

Dumps

A dump is a specific type of trace file. A dump is typically a one-time output of diagnostic data in response to an event (such as an incident), whereas a trace tends to be continuous output of diagnostic data. When an incident occurs, the database writes one or more dumps to the incident directory created for the incident. Incident dumps also contain the incident number in the file name.

Core Files

A core file contains a memory dump, in an all-binary, port-specific format. Core file names include the string "core" and the operating system process ID. Core files are useful to Oracle Support engineers only. Core files are not found on all platforms.

Other ADR Contents

In addition to files mentioned in the previous sections, the ADR contains health monitor reports, data repair records, SQL test cases, incident packages, and more. These components are described later in the chapter.

Structure, Contents, and Location of the Automatic Diagnostic Repository

The Automatic Diagnostic Repository (ADR) is a directory structure that is stored outside of the database. It is therefore available for problem diagnosis when the database is down.

The ADR root directory is known as ADR base. Its location is set by the DIAGNOSTIC\_DEST initialization parameter. If this parameter is omitted or left null, the database sets DIAGNOSTIC\_DEST upon startup as follows:

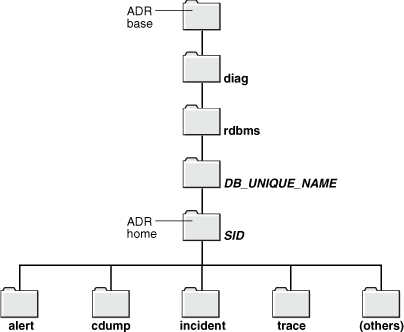
If environment variable ORACLE\_BASE is set, DIAGNOSTIC\_DEST is set to the directory designated by ORACLE\_BASE.

If environment variable ORACLE\_BASE is not set, DIAGNOSTIC\_DEST is set to ORACLE\_HOME/log.

Within ADR base, there can be multiple ADR homes, where each ADR home is the root directory for all diagnostic data—traces, dumps, the alert log, and so on—for a particular instance of a particular Oracle product or component. For example, in an Oracle Real Application Clusters environment with Oracle ASM, each database instance, Oracle ASM instance, and listener has an ADR home.

ADR homes reside in ADR base subdirectories that are named according to the product or component type. Figure 9-1 illustrates these top-level subdirectories.

Figure 9-2 ADR Directory Structure for a Database Instance



Description of "Figure 9-2 ADR Directory Structure for a Database Instance"

Viewing ADR Locations with the V$DIAG\_INFO View

The V$DIAG\_INFO view lists all important ADR locations for the current Oracle Database instance.

SELECT \* FROM V$DIAG\_INFO;

INST\_ID NAME                  VALUE

------- --------------------- -------------------------------------------------------------

      1 Diag Enabled          TRUE

      1 ADR Base              /u01/oracle

      1 ADR Home              /u01/oracle/diag/rdbms/orclbi/orclbi

      1 Diag Trace            /u01/oracle/diag/rdbms/orclbi/orclbi/trace

      1 Diag Alert            /u01/oracle/diag/rdbms/orclbi/orclbi/alert

      1 Diag Incident         /u01/oracle/diag/rdbms/orclbi/orclbi/incident

      1 Diag Cdump            /u01/oracle/diag/rdbms/orclbi/orclbi/cdump

      1 Health Monitor        /u01/oracle/diag/rdbms/orclbi/orclbi/hm

      1 Default Trace File    /u01/oracle/diag/rdbms/orclbi/orclbi/trace/orcl\_ora\_22769.trc

      1 Active Problem Count  8

      1 Active Incident Count 20

The following table describes some of the information displayed by this view.

Table 9-3 Data in the V$DIAG\_INFO View

Name

Description

ADR Base

Path of ADR base

ADR Home

Path of ADR home for the current database instance

Diag Trace

Location of background process trace files, server process trace files, SQL trace files, and the text-formatted version of the alert log

Diag Alert

Location of the XML-formatted version of the alert log

Default Trace File

Path to the trace file for the current session

Viewing Critical Errors with the V$DIAG\_CRITICAL\_ERROR View

The V$DIAG\_CRITICAL\_ERROR view lists all of the non-internal errors designated as critical errors for the current Oracle Database release. The view does not list internal errors because internal errors are always designated as critical errors.

The following example shows the output for the V$DIAG\_CRITICAL\_ERROR view in Oracle Database 11g Release 2 (11.2.0.2):

SELECT \* FROM V$DIAG\_CRITICAL\_ERROR;

FACILITY   ERROR

---------- ----------------------------------------------------------------

ORA        7445

ORA        4030

ORA        4031

ORA        29740

ORA        255

ORA        355

ORA        356

ORA        239

ORA        240

ORA        494

ORA        3137

ORA        227

ORA        353

ORA        1578

ORA        32701

ORA        32703

ORA        29770

ORA        29771

ORA        445

ORA        25319

OCI        3106

OCI        3113

OCI        3135

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[http://docs.oracle.com/cd/E11882\_01/server.112/e25494/diag.htm#ADMIN11007](http://docs.oracle.com/cd/E11882_01/server.112/e25494/diag.htm" \l "ADMIN11007)

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Database Utilities/16 ADRCI: ADR Command Interpreter

[http://docs.oracle.com/cd/E11882\_01/server.112/e22490/adrci.htm#SUTIL700](http://docs.oracle.com/cd/E11882_01/server.112/e22490/adrci.htm" \l "SUTIL700)