14

Diagnosing Failures

Objectives

After completing this lesson, you should be able to:

- Detect and repair database corruption
- Use the Automatic Diagnostic Repository
- Analyze instance recovery with ADRCI
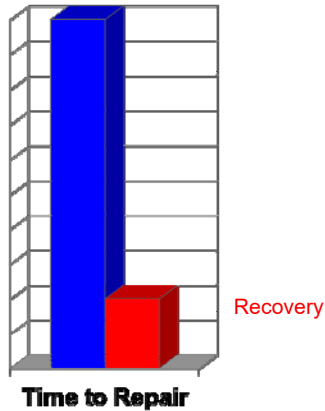- Use Data Recovery Advisor

Reducing Problem Diagnosis Time

Investigation & Planning

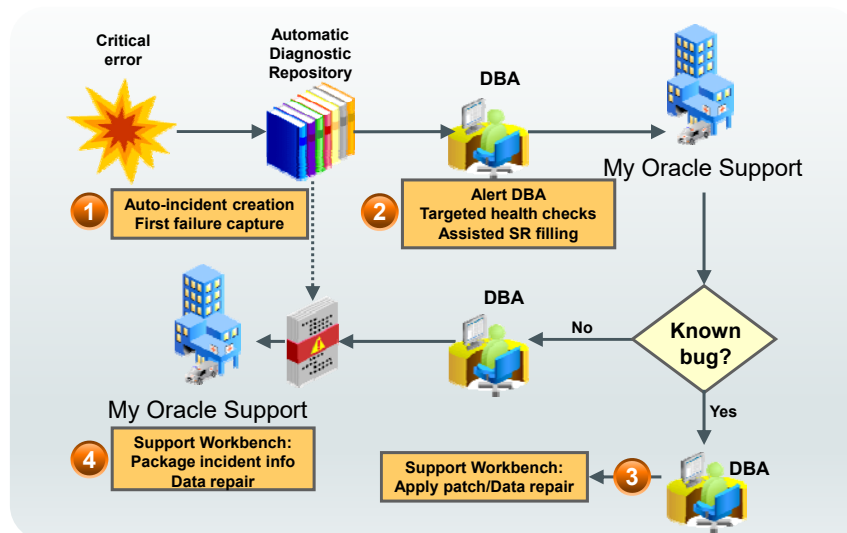Time to Repair

Recovery

Oracle tools for data repair include:

- RMAN for physical media loss or corruptions
- Flashback for logical errors
- Data Guard for physical problems
- Data Recovery Advisor addresses:
  - Problem diagnosis (choosing the right solution can be error prone and time-consuming)
  - Incorrect choices (errors more likely during emergencies)

Automatic Diagnostic Workflow

Automatic Diagnostic Repository

ADR Command-Line Tool (ADRCI)

- ADRCI provides interaction with ADR from an operating system prompt.
- Using ADRCI, you can view diagnostic data within the ADR.

```
$ adrci
ADRCI: Release 12.1.0.1.0 - Production on Thu Nov 29 21:15:27 2012
Copyright (c) 1982, 2012, Oracle and/or its affiliates.
ADR base = "/u01/app/oracle"
ADRCI>
ADRCI> show incident                    ADRCI> set editor gedit
. . .                                    ADRCI> show alert
ADR Home = /u01/app/oracle/diag/rdbms/em12rep/em12rep:
*************************************************************************

INCIDENT_ID PROBLEM_KEY        CREATE_TIME
---------- ----------------   ------------------------
4985        ORA 4031          2012-11-21 00:57:43.823000 +00:00
5161        ORA 4031          2012-11-21 00:58:17.284000 +00:00
2 incident info records fetched
```

V$DIAG_INFO View

```
SQL> SELECT NAME, VALUE FROM V$DIAG_INFO;

NAME                  VALUE
------------------    ------------------------------------------------
Diag Enabled          TRUE
ADR Base              /u01/app/oracle
ADR Home              /u01/app/oracle/diag/rdbms/orcl/orcl
Diag Trace            /u01/app/oracle/diag/rdbms/orcl/orcl/trace
Diag Alert            /u01/app/oracle/diag/rdbms/orcl/orcl/alert
Diag Incident         /u01/app/oracle/diag/rdbms/orcl/orcl/incident
Diag Cdump            /u01/app/oracle/diag/rdbms/orcl/orcl/cdump
Health Monitor        /u01/app/oracle/diag/rdbms/orcl/orcl/hm
Default Trace File    /u01/app/oracle/diag/.../trace/orcl_ora_11424.trc
Active Problem Count  3
Active Incident Count 8
```

Data Recovery Advisor

- Fast detection, analysis, and repair of failures
- Minimizing disruptions for users
- Down time and runtime failures
- User interfaces:
  - EM GUI interface (several paths)
  - RMAN command line
- Supported database configurations:
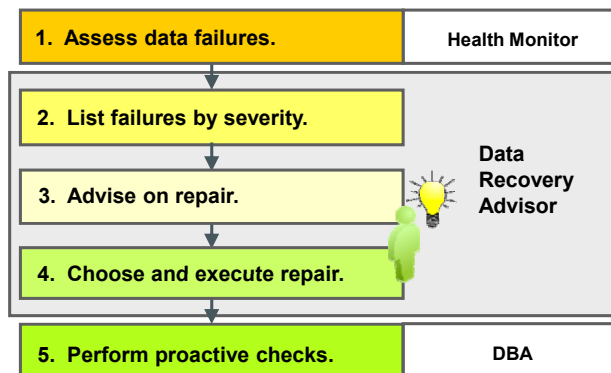 - Single-instance
  - Not RAC

Data Recovery Advisor

Reducing down time by eliminating confusion:

1. Assess data failures.	Health Monitor
2. List failures by severity.	Data Recovery Advisor
3. Advise on repair.	
4. Choose and execute repair.	
5. Perform proactive checks.	DBA

Data Failure: Examples

- Not accessible components, for example:
    - Missing data files at the OS level
    - Incorrect access permissions
    - Offline tablespace and so on
- Physical corruptions, such as block checksum failures or invalid block header field values
- Logical corruptions, such as inconsistent dictionary, corrupt row piece, corrupt index entry, or corrupt transaction
- Inconsistencies, such as control file is older or newer than the data files and online redo logs
- I/O failures, such as a limit on the number of open files exceeded, channels inaccessible, network or I/O error
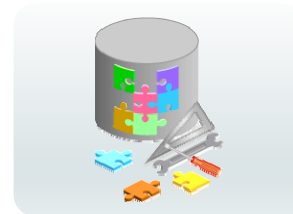
Data Recovery Advisor RMAN Command-Line Interface

RMAN Command	Action
`LIST FAILURE`	Lists previously executed failure assessment
`ADVISE FAILURE`	Displays recommended repair option
`REPAIR FAILURE`	Repairs and closes failures (after `ADVISE` in the same RMAN session)
`CHANGE FAILURE`	Changes or closes one or more failures

Listing Data Failures

The RMAN `LIST FAILURE` command lists previously executed failure assessment:

- Including newly diagnosed failures
- Removing closed failures (by default)

Syntax:

```
LIST FAILURE

[ ALL | CRITICAL | HIGH | LOW | CLOSED |
    failnum[,failnum,…] ]

[ EXCLUDE FAILURE failnum[,failnum,…] ]

[ DETAIL ]
```

Advising on Repair

The RMAN `ADVISE FAILURE` command:

- Displays a summary of input failure list
- Includes a warning, if new failures appeared in ADR
- Displays a manual checklist
- Lists a single recommended repair option
- Generates a repair script (for automatic or manual repair)

```
. . .
Repair script:
    /u01/app/oracle/diag/rdbms/orcl/orcl/hm/reco_29791
    28860.hm
RMAN>
```

14 - 13

Executing Repairs

The RMAN `REPAIR FAILURE` command:

- Follows the `ADVISE FAILURE` command
- Repairs the specified failure
- Closes the repaired failure

Syntax:

```
REPAIR FAILURE
    [USING ADVISE OPTION integer]
    [ { {NOPROMPT | PREVIEW}}...]
```

14 - 14

Classifying (and Closing) Failures

The RMAN `CHANGE FAILURE` command:

- Changes the failure priority (except for `CRITICAL`)
- Closes one or more failures

Example:

```
RMAN> change failure 5 priority low;
List of Database Failures
=========================
Failure ID Priority Status    Time Detected Summary
---------- -------- --------- ------------- -------
5          HIGH     OPEN      20-DEC-18     one or more datafiles are missing
Do you really want to change the above failures (enter YES or NO)? yes
changed 1 failures to LOW priority
```

Data Recovery Advisor Views

Querying `V$` views:

- `V$IR_FAILURE`: List of all failures, including closed ones (result of the `LIST FAILURE` command)
- `V$IR_MANUAL_CHECKLIST`: List of manual advice (result of the `ADVISE FAILURE` command)
- `V$IR_REPAIR`: List of repairs (result of the `ADVISE FAILURE` command)
- `V$IR_FAILURE_SET`: Cross-reference of failure and advice identifiers

Summary

In this lesson, you should have learned how to:

- Detect and repair database corruption
- Use the Automatic Diagnostic Repository
- Analyze instance recovery with ADRCI
- Use Data Recovery Advisor

Practice Overview

- Diagnosing and Repairing Database Failure