16

Performing Database Recovery

Objectives

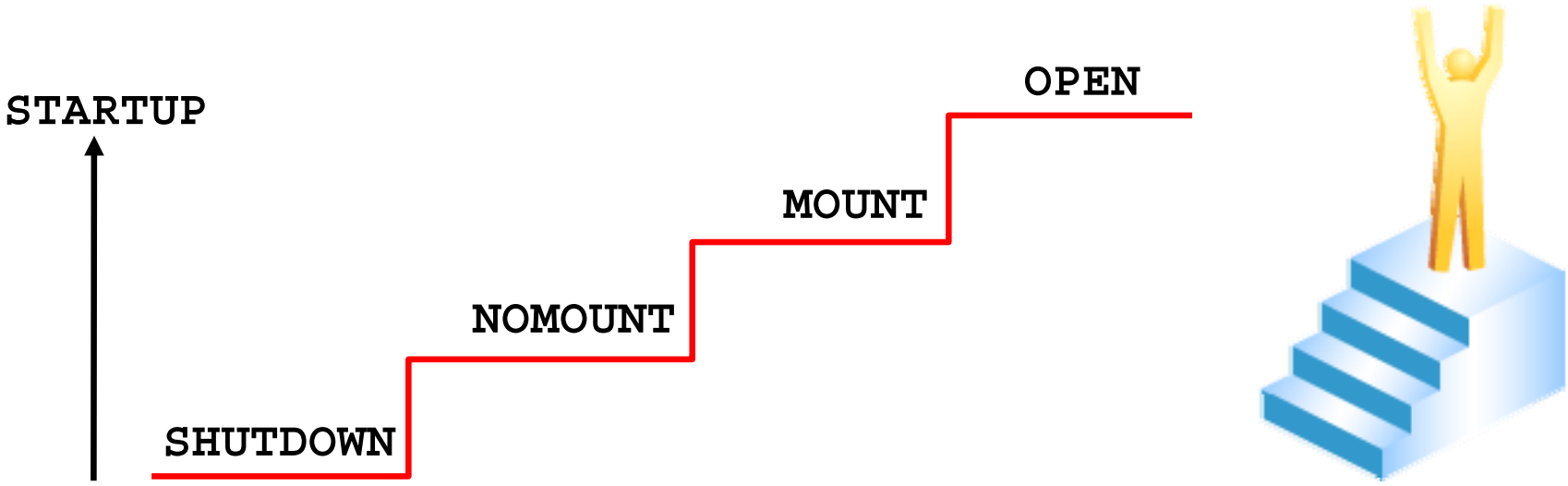
After completing this lesson, you should be able to:

- Determine the need for performing recovery
- Access different interfaces (such as Enterprise Manager and command line)
- Describe and use available options, such as Recovery Manager (RMAN) and the Data Recovery Advisor
- Perform recovery:
  - Control file
  - Redo log file
  - Data file

Opening a Database

To open a database:

- All control files must be present and synchronized
- All online data files must be present and synchronized
- At least one member of each redo log group must be present



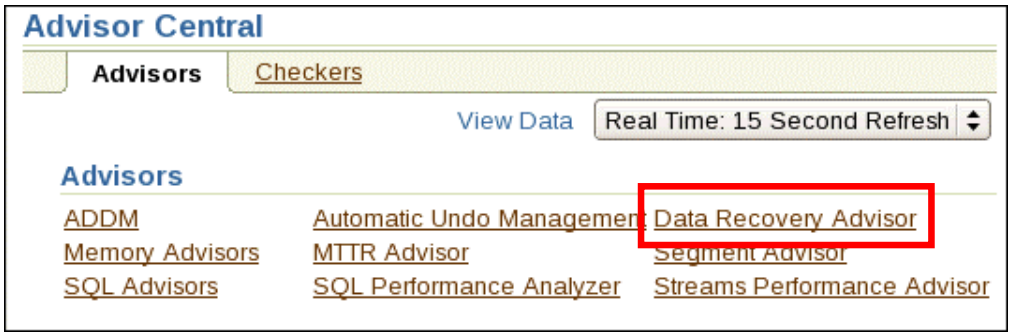
Keeping a Database Open

After the database is open, it fails in the case of the loss of:

- Any control file
- A data file belonging to the system or undo tablespaces
- An entire redo log group
  (As long as at least one member of the group is available, the instance remains open.)

Data Recovery Advisor

- Fast detection, analysis, and repair of failures
- Down-time and run-time failures
- Minimizing disruptions for users
- User interfaces:
  - Enterprise Manager GUI (several paths)
  - RMAN command line



- Supported database configurations:
  - Single instance
  - Not RAC
  - Supporting failover to standby, but not analysis and repair of standby databases

Loss of a Control File

If a control file is lost or corrupted, the instance normally aborts.

- If control files are stored in ASM disk groups, recovery options are as follows:
  - Perform guided recovery using Enterprise Manager.
  - Put database in NOMOUNT mode and use an RMAN command to restore control file from existing control file.

```
RMAN> restore controlfile from
    '+DATA/orcl/controlfile/current.260.695209463';
```

- If control files are stored as regular file system files then:
  - Shut down the database
  - Copy existing control file to replace lost control file

After control file is successfully restored, open the database.

Loss of a Redo Log File

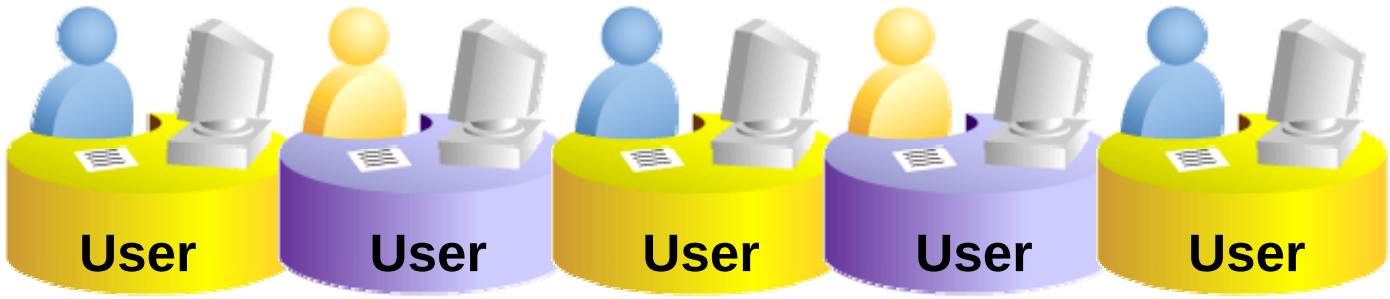
If a member of a redo log file group is lost and if the group still has at least one member, note the following results:

- Normal operation of the instance is not affected.
- You receive a message in the alert log notifying you that a member cannot be found.
- You can restore the missing log file by dropping the lost redo log member and adding a new member.
- If the group with the missing log file has been archived you can clear the log group to re-create the missing file.

Loss of a Data File in NOARCHIVELOG Mode

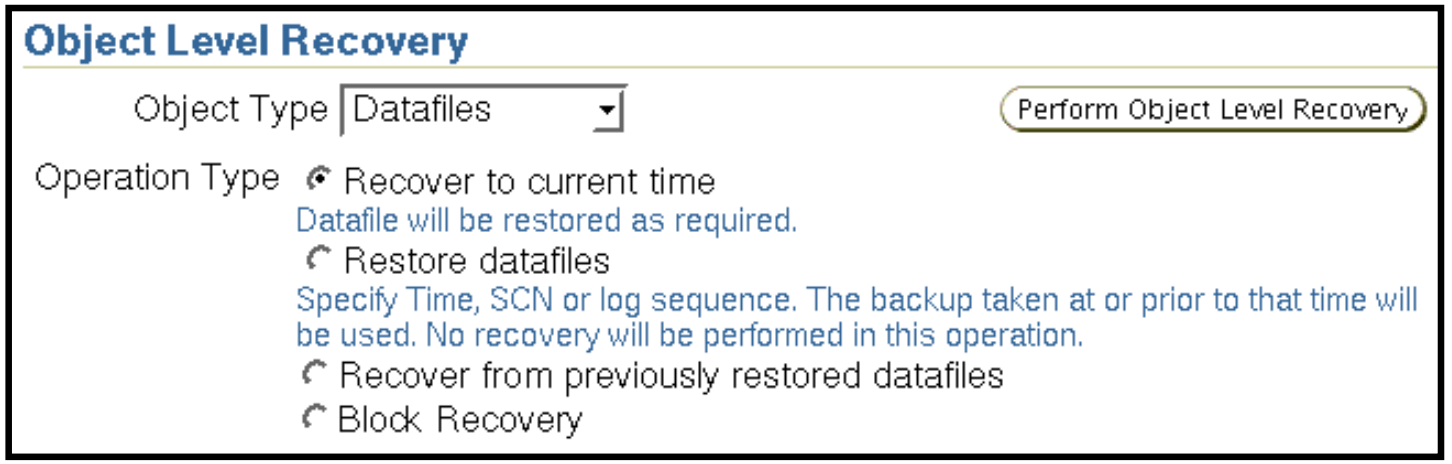
If the database is in NOARCHIVELOG mode and if any data file is lost, perform the following tasks:

1. Shut down the instance if it is not already down.
2. Restore the entire database—including all data and control files—from the backup.
3. Open the database.
4. Have users reenter all changes that were made since the last backup.



Loss of a Noncritical Data File in ARCHIVELOG Mode

If a data file is lost or corrupted, and if that file does not belong to the SYSTEM or UNDO tablespace, you restore and recover the missing data file.



Users

Loss of a System-Critical Data File in ARCHIVELOG Mode

If a data file is lost or corrupted, and if that file belongs to the SYSTEM or UNDO tablespace, perform the following tasks:

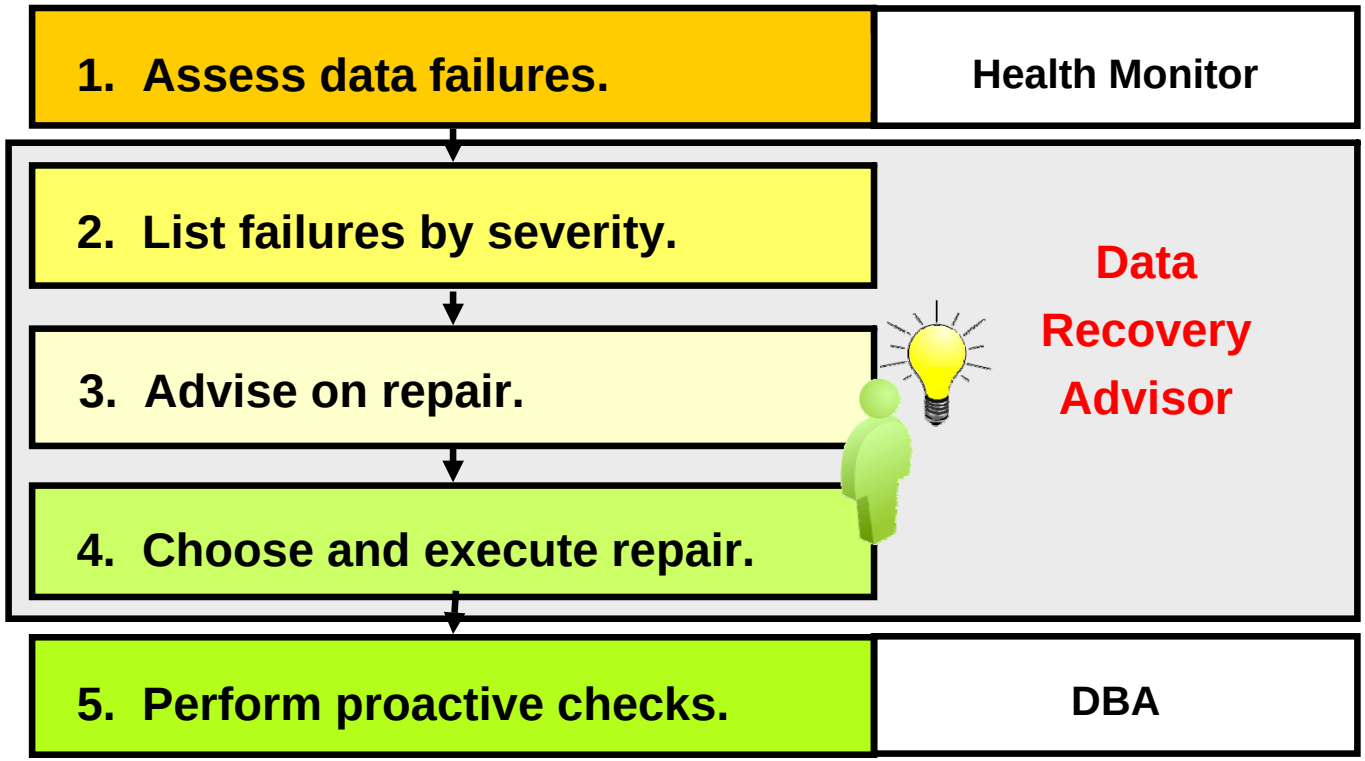
1. The instance may or may not shut down automatically. If it does not, use SHUTDOWN ABORT to bring the instance down.
2. Mount the database.
3. Restore and recover the missing data file.
4. Open the database.

Users

Data Failure: Examples

- Inaccessible components: Missing data files at the OS level, incorrect access permissions, offline tablespace
- Physical corruptions: Block checksum failures, invalid block header field values
- Logical corruptions: Inconsistent dictionary; corrupt row piece, index entry, or transaction
- Inconsistencies: Control file older or newer than the data files and online redo logs
- I/O failures: Limit on the number of open files exceeded, inaccessible channels, network or I/O error

Data Recovery Advisor

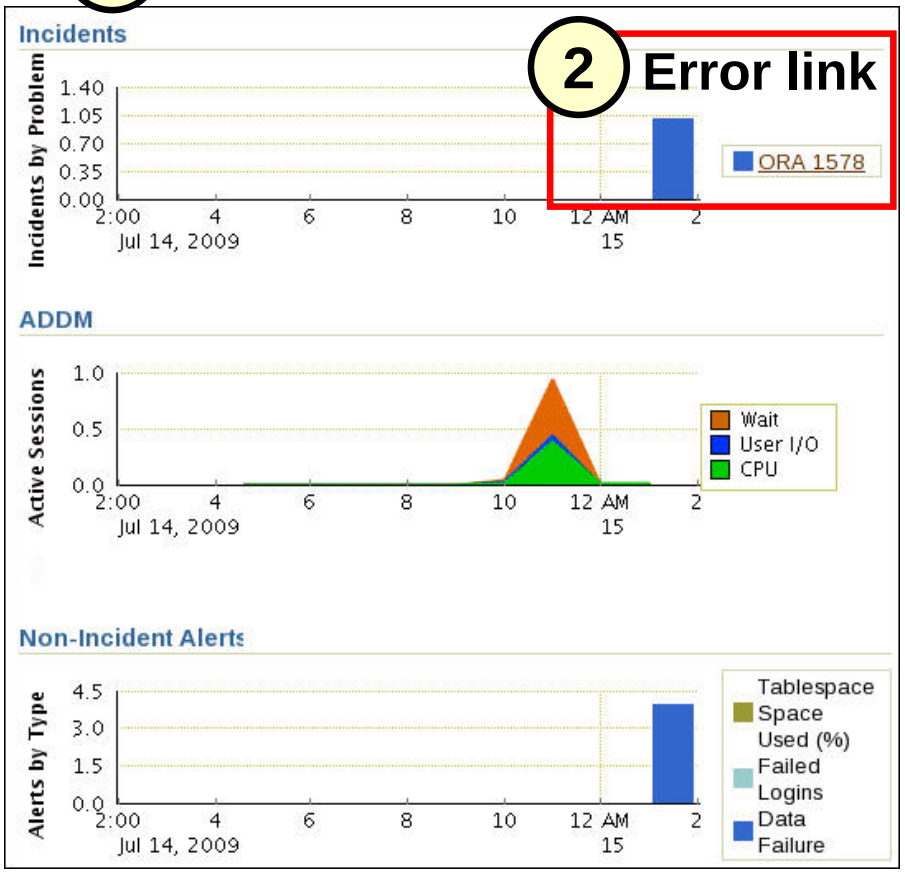


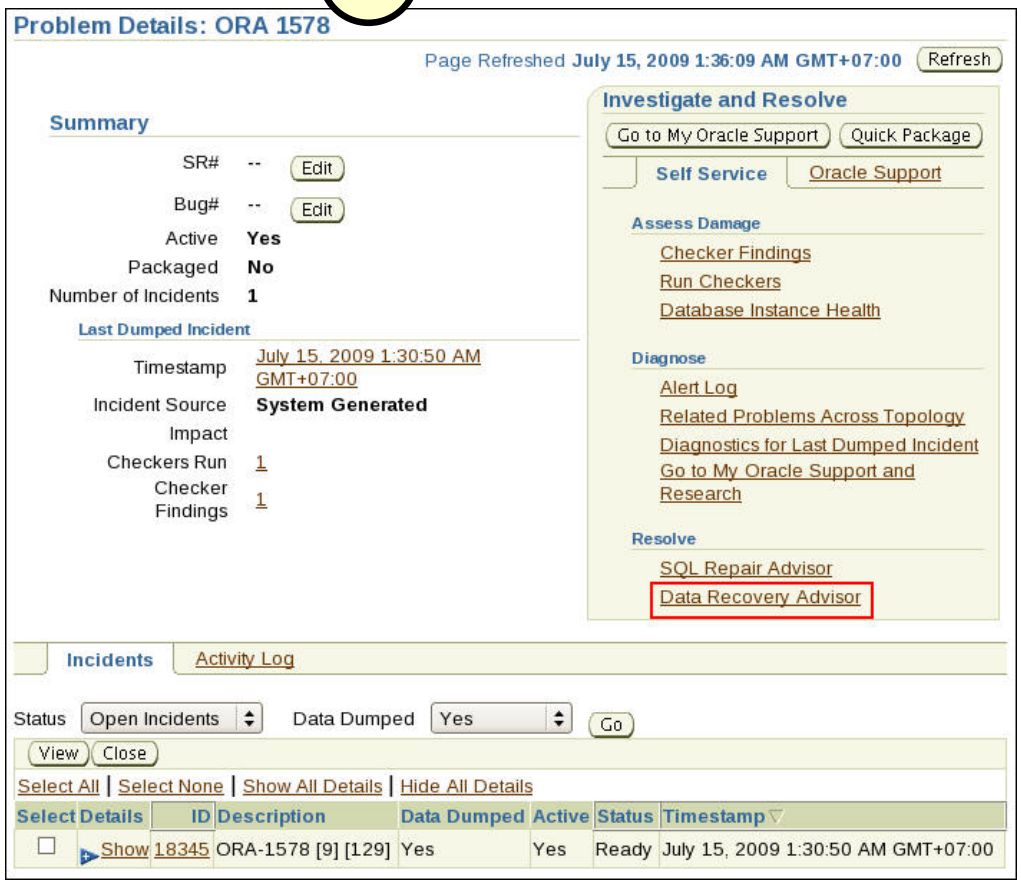
Assessing Data Failures

1 Database instance health

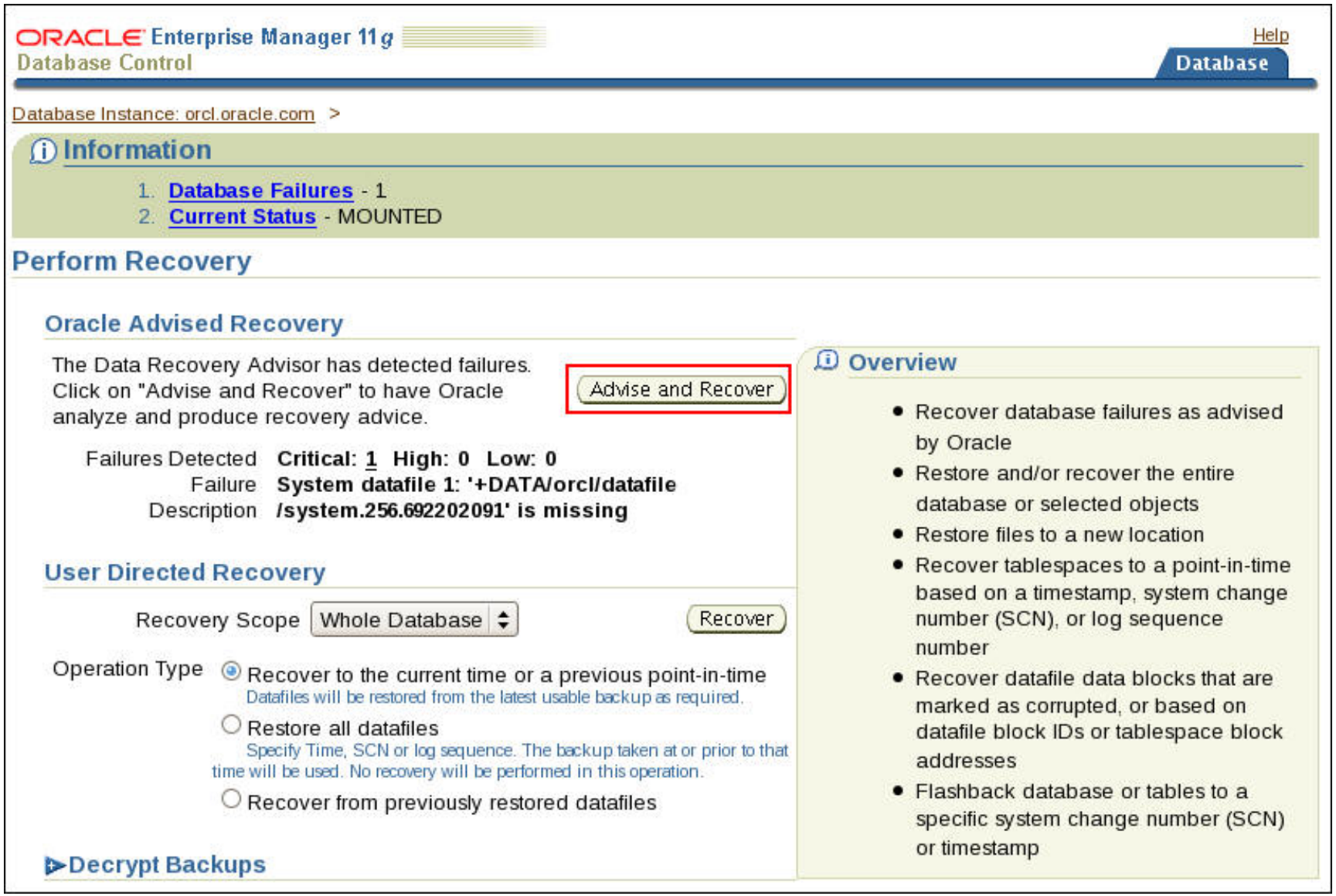
2 Error link

3 Problem details

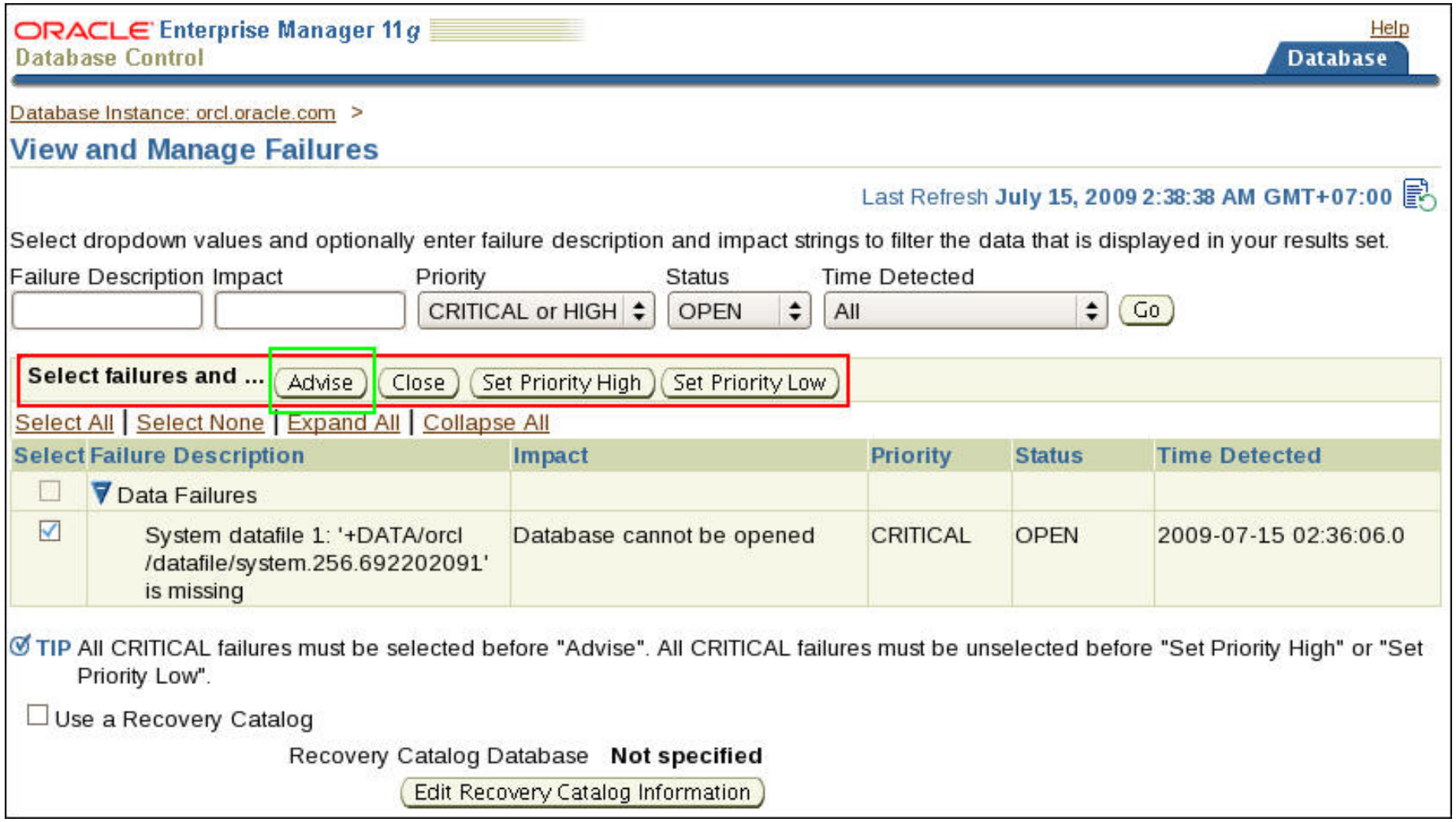




Data Failures

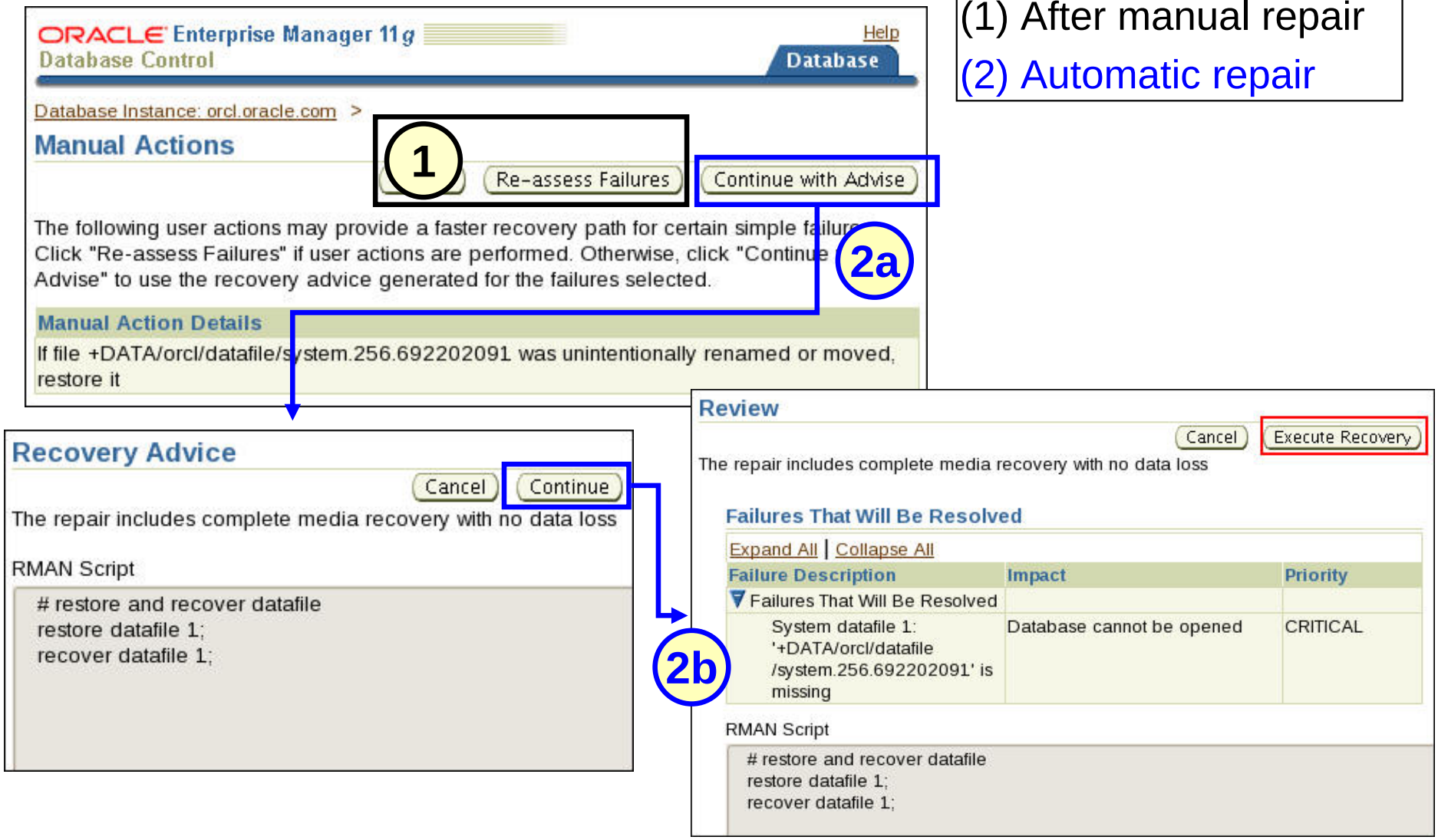


Listing Data Failures

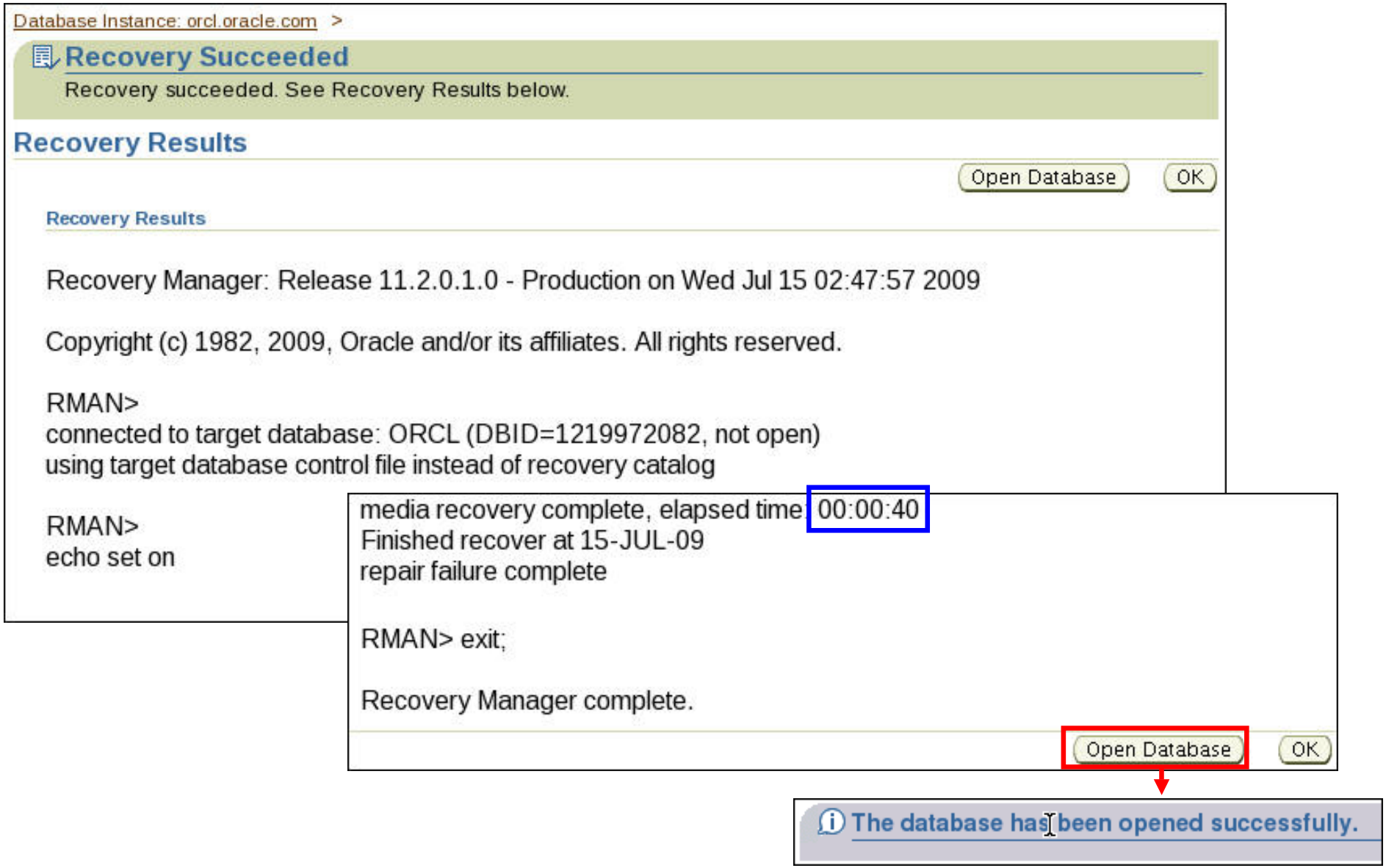


Advising on Repair

(1) After manual repair
(2) Automatic repair



Executing Repairs



Data Recovery Advisor Views

Querying dynamic data dictionary views

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

Quiz

An Instance will not fail if the following event occurs:

1. Loss of a control file if there is a remaining multiplexed control file
2. Loss of the `SYSTEM` tablespace
3. Loss of one redo log member if there is a remaining multiplexed redo log member from the same group of the lost member
4. Loss of the active undo tablespace

Quiz

The information used by the Data Recovery Advisor is only available via the Enterprise Manager interface.

1. True
2. False

Summary

In this lesson, you should have learned how to:

- Determine the need for performing recovery
- Access different interfaces (such as Enterprise Manager and command line)
- Describe and use available options, such as Recovery Manager (RMAN) and the Data Recovery Advisor
- Perform recovery:
  - Control file
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Practice 16 Overview: Performing Database Recovery

This practice covers recovering from the loss of a:

- Control file
- Noncritical data file
- System-critical data file