How to Best Configure, Size, and Monitor the Oracle Database Fast Recovery Area

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About Me/Enkitec

- Who am I?
  - Principal Consultant at Enkitec
  - Worked with Oracle dating back to version 7

- What is Enkitec?
  - Oracle-centered Platinum Partner based in Irving, TX
  - Database consultants averaging over 15 years Oracle experience
  - Making a name for ourselves in the Exadata world

Why I Use the FRA

- Ease of use

- Allows for DBA-level space management

- Provides for easier standardization of environments
  - Uniform place for all recovery-related files

```
SQL> select NAME, (SPACE_USED/SPACE_LIMIT)*100 "% USED" from V$RECOVERY_FILE_DEST;

   NAME                          % USED
   ------------------------      ------
   /u03/fast_recovery_area        85.87
```

Two Real World Customers

Customer #1 – Document Processing

- $350M Revenue, 8,500 employees

- Services 50% of Fortune 100

Customer #2 – Energy Utility

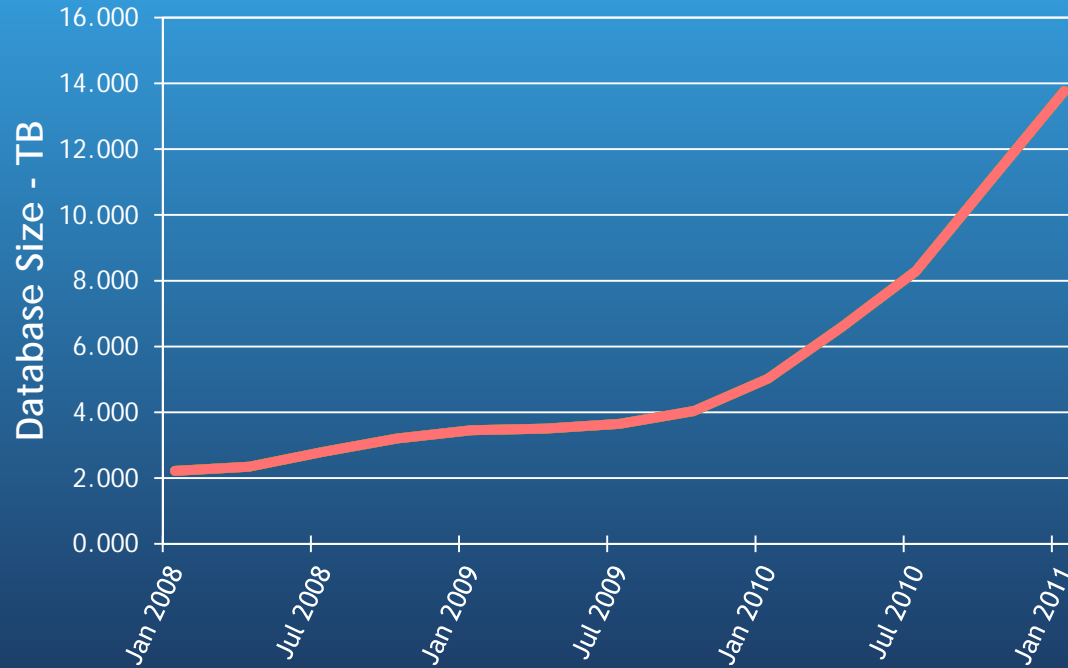- $15B Revenue, 5 million customers

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Customer #1 – Document Processing

- 15TB database, production environment

- Repository for document management

- 270 GB of redo generated daily

- Backups going directly to tape

#1 – Accelerated Database Growth

7x Growth in 3 Years

#1 – Document Processing - Solution

- FRA originally sized at 2TB (based on 7 day archive log retention)

- Monitored database growth with OEM

- Monitored redo generation through Data Guard console in OEM

- Increased db_file_recovery_dest_size to match the growth of the database monthly

- FRA now sized at 9TB

#1 – Document Processing - Solution

Data Guard Considerations

- Standby environment created identical to primary
  - Exadata → Exadata
  - Same size diskgroups for +DATA and +RECO

- All logs sent to FRA

- Always remember that DR site has to be able to run as primary!
  - This includes FRA size – backups, flashback, archive logs, etc

#1 – Backup Commands

`#RMAN archivelog backup command`

`backup archivelog all not backed up`

- Avoid "delete obsolete" through RMAN – Allow the FRA to manage files itself

- Example of FRA automatic file management:
    `deleted Oracle managed file <file_name>`

#1 – FRA file management

```
RMAN> backup archivelog all not backed up;

skipping archived log file <archive_log>; already backed on <date>

skipping archived log file <archive_log>; already backed on <date>

skipping archived log file <archive_log>; already backed on <date>

...

input archived log thread=1 sequence=7 RECID=26 STAMP=762905532

input archived log thread=1 sequence=8 RECID=27 STAMP=762905541
```

Customer #2 – Energy Utility

- Development database

- Customer billing transaction system – will service 5 million customers

- 600GB database

- Backups going to FRA and tape

- Weekly data refresh

- Flashback database enabled

#2 – Energy Utility - Solution

- FRA sized at 150GB

- Sizing based on:
  - Flashback logs
  - Archive log generation
  - Database backups

- Frequent database flashbacks

#2 – Energy Utility - Solution

Flashback Methodology

- Flashback retention set to 1 week

- Created a guaranteed restore point before each refresh, data refreshed weekly

- Monitored the usage of the FRA through OEM reports, alerting based on space available

- After process was repeated a few times, optimal FRA size was found, based on recovery file generation

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#2 – Energy Utility - Solution

Monitoring FRA Usage

```
SQL> SELECT * FROM V$FLASH_RECOVERY_AREA_USAGE WHERE PERCENT_SPACE_USED > 0 ;
```

FILE_TYPE	% USED	% RECLAIM	# FILES
CONTROL FILE	.24	0	1
REDO LOG	3.72	0	3
ARCHIVED LOG	31.11	26.82	31
BACKUP PIECE	33.17	0	15
FLASHBACK LOG	17.6	0	42

Two Real World Customers

Customer #1 – Document Processing

Customer #2 – Energy Utility

What we learned from each

- Configuring and sizing FRA was quick and easy

- Monitoring usage of the FRA is imperative, especially with rapid database growth

- Be prepared to tweak the settings during the initial stages

FRA On Exadata and ODA

- Planning the size of the FRA is even more important with Oracle's engineered systems

- Disk sizing is more difficult to perform on these systems after they are in place because the diskgroups share the same physical disks

- If you have the space, leave plenty for RECO, so that you can utilize image copies and longer flashback/backupset retention period

Questions?

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