



RMAN Backups of Oracle Standby Databases

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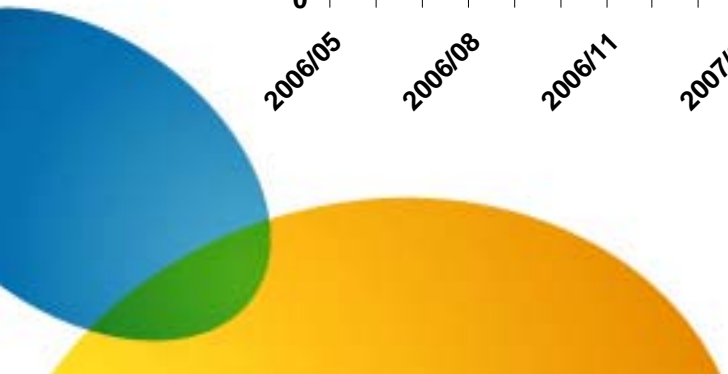
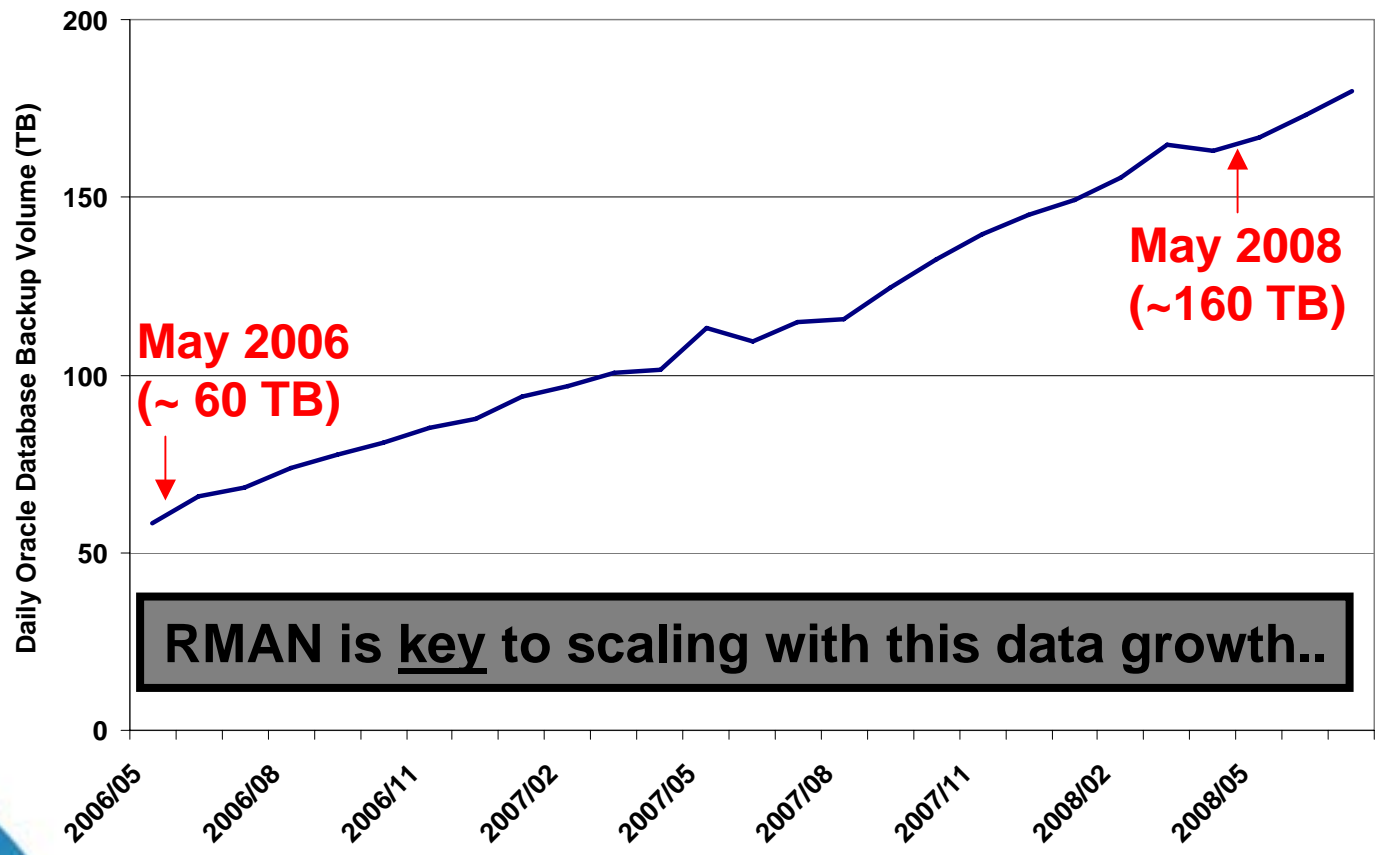
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BT Oracle Production Databases : Current Estate

- Database Platforms
 - 1,500+ Unix Servers
 - 4,000+ Instances, including standby databases
 - Oracle8i -> Oracle Database 10g
 - Solaris, HP-UX, Linux
 - Daily Oracle database backup volume = 200TB+ (excludes largest VLDBs)
- Applications
 - OLTP, Warehouse, batch/order processing, Siebel, in-house
- Oracle Backup & Recovery Methods
 - OS “hot backup” to tape
 - RMAN backup to tape
 - RMAN incremental backup to disk
 - RMAN ‘incremental forever’ to Flash Recovery Area (FRA), then backup FRA to tape.
 - Primary and standby databases backed up using control file as RMAN repository (backups are not shared).
 - Array-based snapshots
- Media Management
 - Symantec NetBackup 6.0
 - 6,000+ NetBackup Clients (many non-database)
 - Networked and dedicated configurations

Data Volumes : Sustained, Consistent Growth



BT Oracle Production Databases : Evolving Estate

- Consolidation of Oracle Platform to shared, pre-provisioned environment
 - Oracle MAA-based architecture
 - Pre-provisioning => reduces overheads to design, build, deliver
 - Catalogue of pre-defined database services
 - Published RPO / RTO associated with each database service
 - Oracle Database 10g -> Oracle Database 11g on RedHat Linux
 - Suitability for 90%+ of DB requirements
- Smaller, smarter set of Backup & Recovery Methods
 - RMAN only
 - Deploy Recovery Catalog for backup management
 - Offload backups to standby databases
 - Increase adoption of RMAN incremental backup techniques
- Media Management
 - NetBackup
 - VTL
 - Oracle Secure Backup: faster tape backups via RMAN integration

Oracle Database Services

- Database Service Catalogue-based offerings
 1. Single instance, single site
 - Cold failover cluster within single site
 2. Multi-instance RAC database, single site
 3. Single instance, multi-site
 4. Multi-instance RAC database, multi-site
- Increased levels of service availability offered with each option.
- Maximum Performance Mode (asynchronous) for Data Guard
- Option 3 and 4 affords opportunity to offload backups to standby database.

RMAN Backups Offloaded to Standby Database

- Advantages
 - Remove backup load & reduce storage on primary database
 - Minimize operational effort:
 - Perform all backup maintenance on standby database
 - Standard RMAN syntax on standby database
 - RMAN used to housekeep archived redo logs on standby
- Restore of primary from standby disk or tape backups requires network-based file transfer.
- Backup tags dynamically generated:

```
BACKUP DATABASE
```

```
TAG          = 'emgcl1_20080820051003_D'
```

```
FORMAT      =
```

```
'emgcl1_20080820051003_D_469595531_%s_%p_%c_%t';
```



Standard RMAN Operations on Standby Database

- Automatic control file and SPFILE backup and/or current controlfile backup

```
CONFIGURE CONTROLFILE AUTOBACKUP
```

```
  FORMAT FOR DEVICE TYPE 'sbt_tape' TO 'emgcla1_CTL_%F' ;
```

```
BACKUP CURRENT CONTROLFILE
```

```
  TAG          = 'emgcla1_20080820051003_D'
```

```
  FORMAT      =
```

```
  'emgcla1_20080820051003_D_c-469595531-20080820-051003'
```

- Backup maintenance performed on standby (note: scripts carried forward from older releases):

```
CHANGE BACKUP TAG 'emgcla1_20080820051003_D'
```

```
  KEEP UNTIL TIME = 'SYSDATE+12' LOGS;
```

```
CROSSCHECK BACKUP
```

```
  COMPLETED BETWEEN 'SYSDATE-12' AND 'SYSDATE-10' ;
```

```
DELETE FORCE NOPROMPT EXPIRED BACKUP
```

```
  COMPLETED BETWEEN 'SYSDATE-12' AND 'SYSDATE-10' ;
```



RMAN Archived Log Management on Standby

- Archived log backups on standby:

```
BACKUP ARCHIVELOG
  FROM SEQUENCE = 19039
  UNTIL SEQUENCE = 19041
  THREAD          = 1
  TAG              = 'emgcla1_20080820051003_A'
  FORMAT          =
    'emgcla1_20080820051003_D_469595531_%s_%p_%c_%t' ;
```

- RMAN used to housekeep logs:

```
DELETE NOPROMPT ARCHIVELOG
  FROM SEQUENCE = 19039 UNTIL SEQUENCE = 19040 THREAD = 1 ;
DELETE NOPROMPT ARCHIVELOG
  FROM SEQUENCE = 14080 UNTIL SEQUENCE = 14081 THREAD = 2 ;
DELETE NOPROMPT ARCHIVELOG
  FROM SEQUENCE = 14167 UNTIL SEQUENCE = 14168 THREAD = 3 ;
```

Oracle Database 11g Features of Interest to BT

- Network-based Database Duplication : essential feature
- Network-based restore from standby database
- Recovery catalog tracks files & backups per `db_unique_name`
- Block change tracking on standby database
- Faster backup compression
- Open read-only database available whilst redo apply active (Active Data Guard)
- Closer integration with Oracle Secure Backup
 - Enhanced backup performance: eliminate committed undo during full backup
 - Reduced CPU utilization via integration with RMAN memory buffers