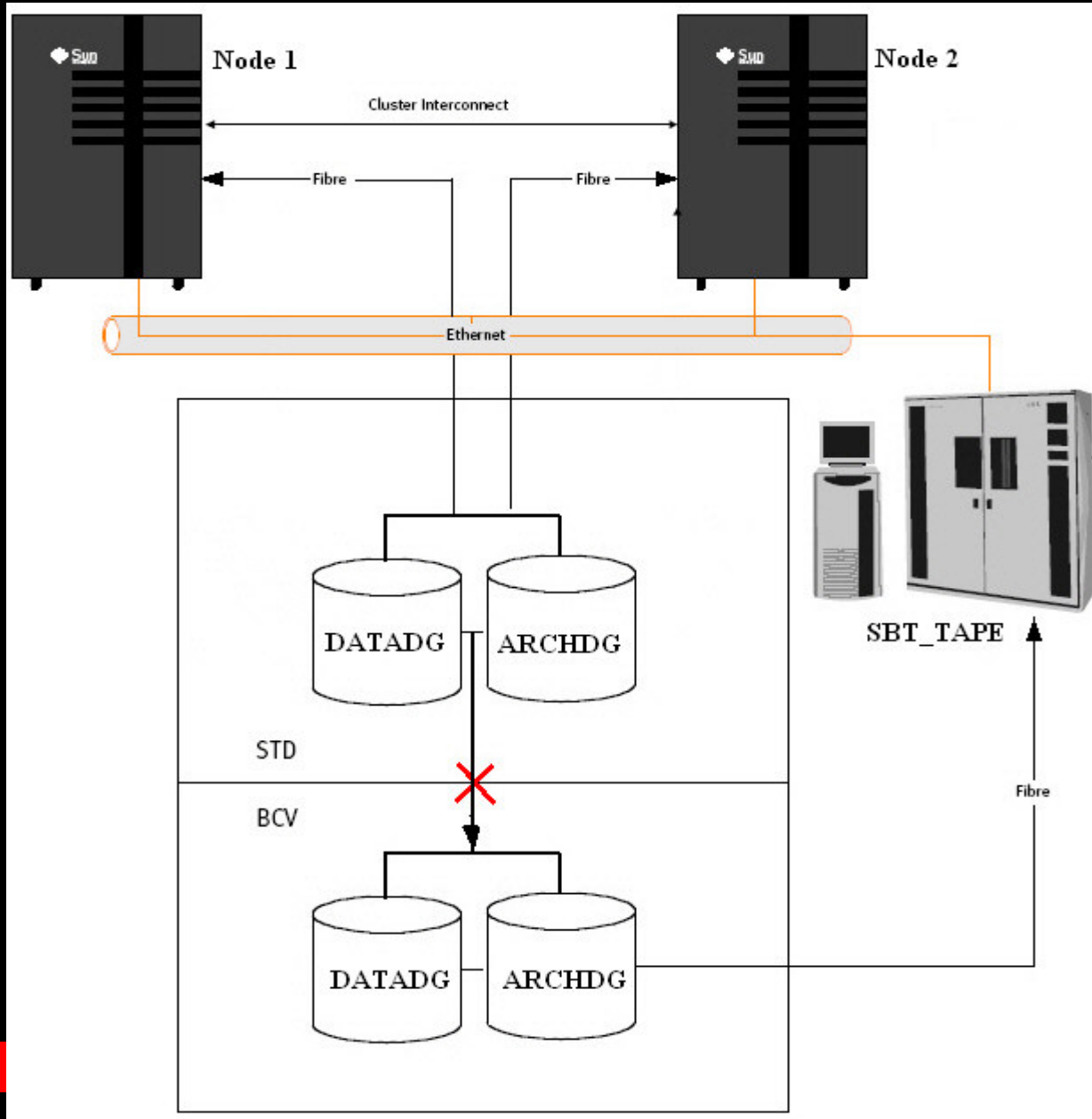# ASM and for 3rd Party Snapshot Solutions - for Off-host backup

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POINT-IN-TIME COPY TECHNOLOGIES

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POINT-IN-TIME COPY TECHNOLOGIES

- Generic guidelines & best practices for off-host backups of 10g ASM based databases
- Leverages 3rd Party Snapshot technologies
    - Timefinder (EMC)
    - ShadowImage (HDS)
    - Business Copy (HP)
- The 3rd Party point-in-time copy solutions must have completed OSCP script validation

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GENERAL ASSUMPTIONS & REQUIREMENTS – Source system

- 3rd party point-in-time copy solution supports full LUN copy point-in-time copy
- All disks in a disk group must be split atomically with respect to write completion (preserving write ordering)
- An ASM disk group is configured for one database only
  - cannot snapshot one database and not the others if you have consolidated several databases into one ASM disk group

GENERAL ASSUMPTIONS & REQUIREMENTS – Source system

- Configure ASM with two diskgroups
  - 'DATADG' diskgroup contains database data files only (no redo log or control file)
  - 'ARCHDG' diskgroup contains: Online redo logs, control file, archive and flashback logs

- Two storage array LUN groups must encapsulate all disks from DATA and ARCHDG; respectively.

- All ASM disk groups configured with external redundancy mirroring

GENERAL ASSUMPTIONS & REQUIREMENTS – Backup host system

- The backup host is configured similarly to primary
  - Same OS level
  - Same user and group id
  - Same directory structure for Oracle binaries

- RMAN recovery catalog is required
  - Primary and Backup host should have Oracle Net connectivity to RMAN Recovery Catalog

- The backup host should have a copy of database init.ora and password file (if one exists)
  - For ASM and database

GENERAL ASSUMPTIONS & REQUIREMENTS – Backup host system

- Backup host has access to "split disks"

- The Production host should have access to the LAN-based tape backup system for restore

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Procedure and Steps
CREATE A DATABASE SNAPSHOT COPY FOR BACKUP

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Initial Setup Procedure

- Identify the disks (LUNs) in ASM DATADG diskgroup. Repeat this step for the ARCHDG diskgroup.
    - select a.group_number,path, name from v$asm_disk a, v$asm_diskgroup b where a.group_number=b.group_number and b.group_name = 'DATADG'

    GROUP_NUMBER PATH NAME
    1 /dev/rdsk/c3t19d16s4 DATADG_0001
    1 /dev/rdsk/c3t19d17s4 DATADG_0002
    1   /dev/rdsk/c3t19d39s4 DATADG_0003

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Initial Setup Procedure

- Create storage volumes that encapsulate the disks identified in previous bullet with the point-in-time copy solution

- Establish and synchronize the volume group

- Once fully synchronized, split the mirror pair for the volume group

- This snapshot copy volume group can now be seen on the Backup host.
  - Verify that these volumes are seen on the Backup host

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High Level Backup Process

- ## Prerequisites

  - Storage Array is configured with the correct LUN groups
  - LUN groups mirror pairs are fully synchronized

Backup Step-by-Step Procedure

Primary Host

- Force a log switch
    - SQL>alter system archive log current;

- Place the database in backup mode.
    - SQL> alter database cubs begin backup;

- Split mirror pair for DATADG
    - 3rd party Snapshot application command

- Take the database out of hot backup mode.
    - SQL> alter database cubs end backup;

Backup Step-by-Step Procedure

Primary Host

- Force current log to be archived
    - SQL> alter system archive log current;

- Create two copies of a backup controlfile.
    - One copy of the control file, called "control_start" will be used to start the database in mount mode on the backup server.
    - The second copy, named "control_backup", will be part of the backup set by RMAN.
    - The init.ora file's "CONTROL_FILES" parameter on the backup server points to "control_start" copy of control file. (CONTROL_FILES='+DATADG/cubs/control_files/control_start'

Backup Step-by-Step Procedure

Primary Host

- RMAN> run {

allocate channel foo type disk;

copy current controlfile to
'+ARCHDG/cubs/control_files/control_start' ;

copy current controlfile to
'+ARCHDG/cubs/control_files/control_bakup';}

Backup Step-by-Step Procedure

Primary Host

- Resynchronize the RMAN catalog with production database. This adds the most recent archive log info to the recovery catalog.

  - Connect to RMAN catalog and production database:
    RMAN> resync catalog;

- Split the mirror pair for the volumes containing the ARCHDG diskgroup. The backing up the archive logs can occur multiple times a day as required.

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Backup Step-by-Step Procedure – Backup Host

- Startup ASM instance. Ensure the appropriate init.ora is used to startup the ASM instance. When ASM is successfully started, all the necessary diskgroups should be available. Verify using:
  - SQL> select * from v$asm_diskgroup;

- Startup and mount the database, Note, the init.ora file should have the CONTROL_FILES variable point to '+ARCHDG/cubs/control_files/control_start file'
  - SQL>startup mount

- Backup the database using RMAN, including the archive log files and backup controlfile

Backup Step-by-Step Procedure – Backup Host

- Connect to recovery catalog and target database on the Backup host (which is now mounted),

RMAN> run {allocate channel t1 type 'SBT_TAPE';

backup

format 'ctl_%d_%s__%p_%t'

Controlfilecopy '+ARCH/cubs/control_files/control_bakup ';

backup full

format 'db_%d_%s_%p_%t'(database);

backup format 'al_%d_%s_%p_%t'

(archivelog all);

release channel t1; }

# On the Production Host

- Delete obsolete archive logs from the log archive area (ARCHDG diskgroup).

- RMAN> delete archivelog backed up 2 times to device type 'sbt';

POST BACKUP PROCEDURE

- Once the backup is complete, two options are available for point-in-time copy management:
  - Shutdown ASM and database instances, but leave the point-in-time copy available on Backup host. This will prevent accidental updates to this backup database.
  - Re-synchronize LUN Groups with production volumes. The disadvantage of this option is that split volumes cannot be used to recover the database; i.e., tape restore is the only option.

RESTORE PROCEDURE METHODS
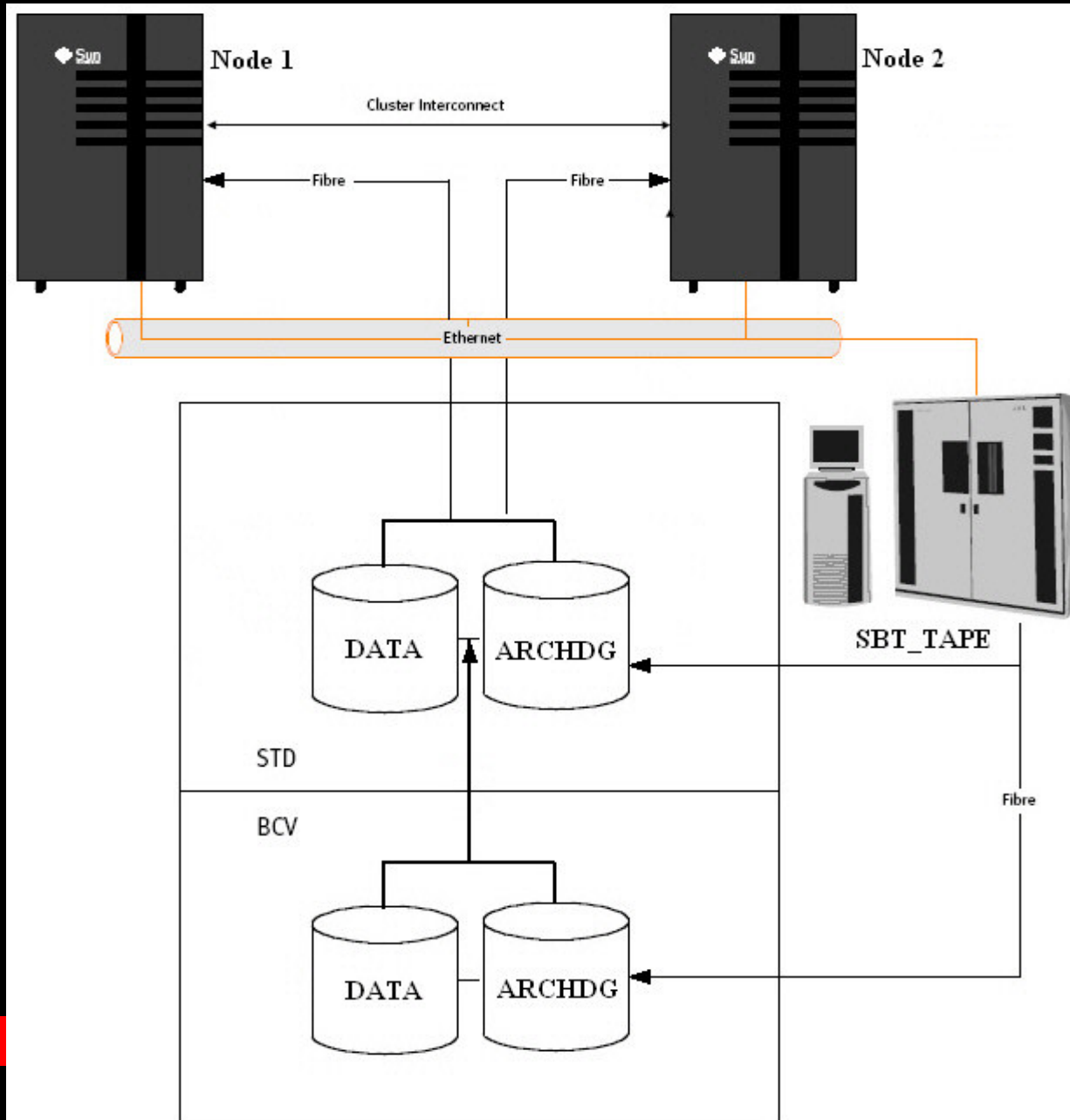
SUMMARY

- Off-host backups reduce impact on primary server(s)

- Benefit from RMAN internal block checks

- Can backup to disk on backup server then to tape: D2D2T.

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