Regenerating Corrupted Tapes

Peter Edwards
CSIRO Advanced Scientific Computing

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Introduction

- DMF analyses errors to attempt to avoid future problems
  - http://hpsc.csiro.au/users/dmfug/Meeting_May2010/Presentations/tape_error_avoidance.pdf
- That doesn't prevent or repair the effects of the original error
- DMF notifies administrator of the problem via email
- The DMF Administrators Guide describes repair methods
- Sometimes there are more efficient procedures available

Failure modes discussed:

The following corruptions will be discussed:

- Failure to append
- Unable to recall

“Failure to append” email

Volume G63132 has an excessive error-rate while appending - setting HVFY to prevent further writing to this suspect tape. It should be tested and/or replaced before being used for writing again.

Read access is still available.

An example of a destructive test of the entire tape would be:

```
/usr/sbin/dmtapetest -l ls G63132
```

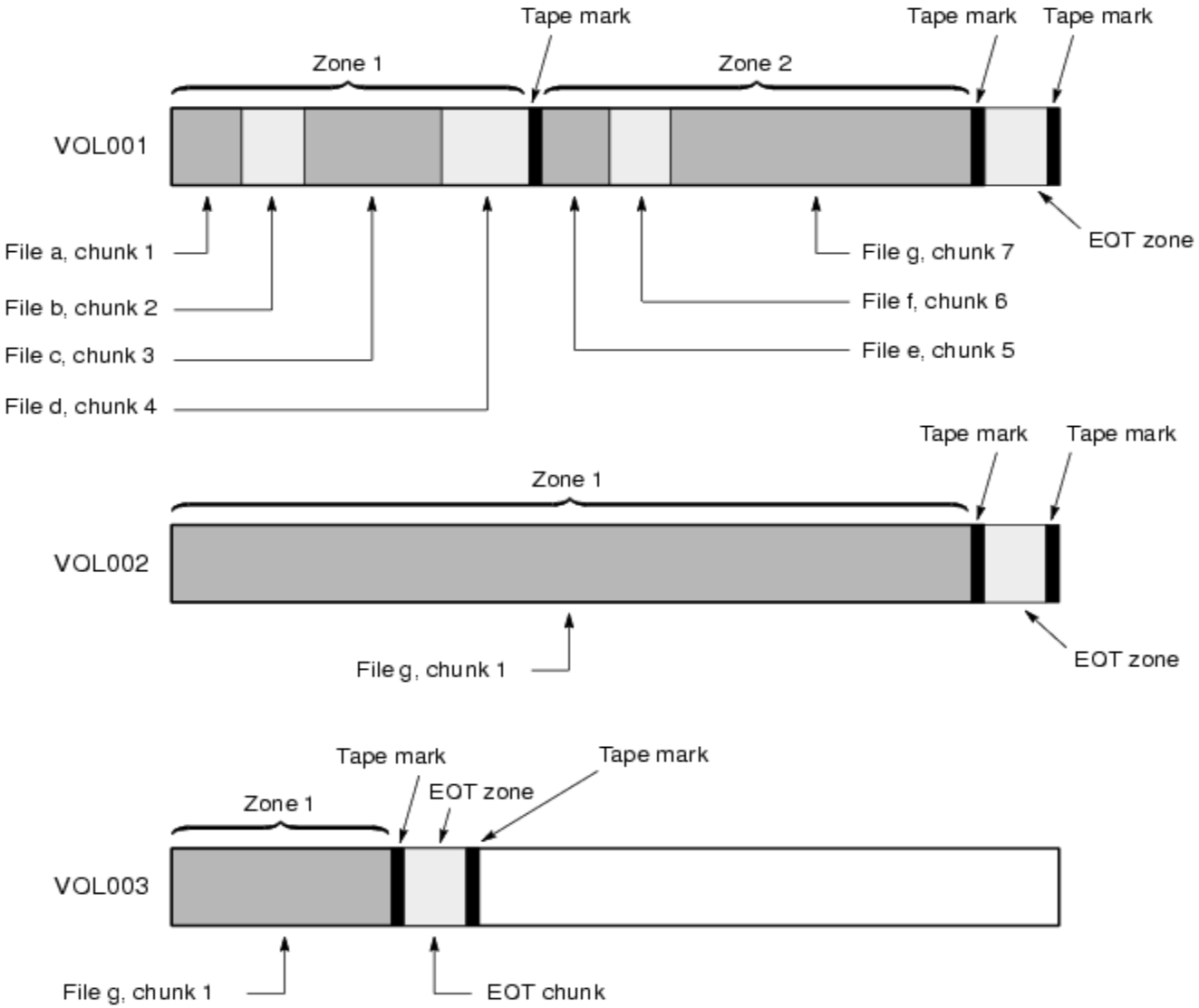
To non-destructively verify the existing data run:

```
/usr/sbin/dmatsnf -V te2 -v G63132
```

To return the tape to production enter:

```
/usr/sbin/dmvoladm -l ls -c 'update G63132 to hvfy off'
```

DMF Tape Format



Failure to append – an alternative

- The DMF Administrators Guide suggests merging the tape by setting HSPARSE
  - This is easy, but slow
- An alternative which frequently works is to empty the last zone using dmmove.
  - This is because when DMF appends to a tape, it expects to position to a valid zone header which it will then overwrite; if that header is corrupt, then the append will fail as a safety measure. If you then empty the last zone, then it will position to that now-empty zone's header instead of to the corrupted EOT zone.

- Get the BFIDs of the files in the last zone
- Delete them from the VG which the tape belongs to
- Add them back again
- Clear HVFY with dmvoladm
- Wait until DMF next tries to append to that tape
- If it fails, follow the HSPARSE approach

Failure to append – zone emptying example

```
cherax#  dmvoladm -qc 'list G63110'
                                                DATA    EOT
 EOT                WR/FR
VSN      VOLGRP LB      DATA LEFT
WRITTEN  CHUNK  ZONE   HFLAGS
AGE
-------------------------------------------------------
-------------------------
G63110      bc2 al 1021076.845324
```

“Unable to recall” email

Volume G61676 has an excessive error-rate - setting HLOCK to deny all access for the next 1800 seconds

Unable to recall

- Although one file may not be recallable, others in the same zone may be, and those in other zones probably are
- Emptying the tape by merging is a sequential operation (unlike recalls) so there's a problem when it reaches the bad spot – it probably won't skip over it
- Need to hard delete the file(s) on the bad spot with dmmove – you might as well do the whole zone
  - You could use dmhdelete instead if the files are soft deleted and you know you won't change your mind
- Merging should then move the rest of the data

Unable to recall – example of hard delete

```
cherax#  find_bfids -z -r U96998
vsn=U96998 zn=35
4036b27700000000064bc566

cherax#  echo 4036b27700000000064bc566 | dmmove -b -d sec te2
Number of files processed 1, Amount of data 470.959991 MB

cherax#  echo 4036b27700000000064bc566 | dmmove -b sec te2
Number of files processed 1, Amount of data 470.959991 MB

cherax#  find_bfids -z -r U96998 > /dev/null
vsn=U96998 zn=41
```

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Phone: 03 8601 3812
Email: peter.edwards@csiro.au
Web:http://hpsc.csiro.au/users/dmfug/

www.csiro.au

Thank you

Contact Us
Phone: 1300 363 400 or +61 3 9545 2176
Email: enquiries@csiro.au Web: www.csiro.au

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