# Making Media Copies in OSVault

## Introduction

OSVault has the ability to make exact copies of media that is in use.  The exact copies are intended as disaster recovery options, or to send to other parties that wish to read the data contained on the media.  OSVault will not automatically use the copies of media in the event that the original copies become unusable.  Replacing unusable media with a copy is a manual process.

## How Media Copies are Initiated in OSVault

There is a utility called *copymedia* that performs the actual copy of an existing media onto another piece of media.  *Copymedia* runs in two basic modes: single drive and dual drive.

In single drive operation, *copymedia* will mount the original (used) piece of media into a drive and copy the entire image of the media onto a temporary space on the server hard disk.  There needs to be adequate space on the server hard disk to store the image of the media and *copymedia* will verify that the space exists. After the image of the original media has been transferred, *copymedia* will dismount that piece of media from a drive and insert an unused piece of media into a drive (either from a user-specified location or automatically from the copy pool in the library).  The image from the hard disk is then copied onto the new piece of media, and the media is returned to its storage location.

## Initializing Media for Use with Copymedia

Media to be used by *copymedia* does not need to be labeled or otherwise processed prior to use.  For BD-RE, DVD-RAM and PDD media, the media must be physically formatted prior to use, but most vendors of that media format it prior to shipping.

## Specifying a Copy Pool in the Optical Library

If you wish for *copymedia* to use the pool of copy media in the library, you must set that pool's location (called the copy pool range) via either the *inventory* program or the setcopyrange program.  With the *inventory* program, you can use the –copy_start and --copy_end flags to specify that copy pool range.  For example if you wish to set aside the last 50 slots in an ASACA AM-750 library as the copy pool, run *inventory* like this:

        inventory –l /dev/sg1 –copy_start=4846 –copy_end=4896

This command will tell the *inventory* program, as it is checking every piece of media, to mark the last 50 slots (slots start numbering at 4096 in the ASACA library) as the copy pool range and to use any media found in those slots for copymedia operations.

If you do not wish to re-run the *inventory* program, which is a time consuming process, there is another program called *setcopyrange* that can create a copy pool in the optical library without having to load any media into a drive.   With the *setcopyrange* program, the range of slots specified is set aside for copy media, and the library is queried to see if media exists in those slots.  Any slot in the copy pool range found to contain slots is

marked in the OSVault database as a potential piece of media to use for *copymedia* operations.  So, to repeat the previous example, if you wish to set aside the last 50 slots in an ASACA AM-750 library as the copy pool without running inventory, run *setcopyrange* like this:

> setcopyrange  –l /dev/sg1 –copy_start=4846 –copy_end=4896

This command will only create the copy pool range in the library, it will not create the inventory database entries that the *inventory* program does.

## One or Two Drive Copy Operations

The *copymedia* command can use either a single optical drive for the copy operation or two drives for the copy operation.  If your optical library only contains one working (online) optical drive and you indicate to use two drives for the *copymedia* operation, you will receive an error message from *copymedia* and the program will exit without copying. By default, *copymedia* uses only a single drive to copy media.  This means that an original piece of media is mounted, its entire contents are copied to temporary hard disk storage, and then the copy media is mounted and the temporary storage is written out to the copy.  The advantage to this process is that a maximum number of other drives are available during this copy operation for other uses.  The disadvantage is that the copy operation will take longer to run.

With the two drive operation, the *copymedia* command will mount both the original and the copy media at the same time and lockup two drives for the duration of the copy operation.  The media is then copied directly from the original to the copy.  Then the two pieces of media are returned to either original storage locations and the drives are then free for other operations.  The advantage to two drive copies is faster copy times, but the disadvantage is having two drives tied up and unavailable for other uses for the duration of the copy.

In libraries with 3 drives or less, using a one drive copy usually is preferred.

To select one drive copy, use the -1 flag to the *copymedia* command.  For example, the following command will use one drive to make a copy of volume OPTICAL00007A:

> copymedia –l /dev/sg1 –v OPTICAL00007A –1

To select two drive copy operations, use the -2 flag to the *copymedia* command.  For example, use a command similar to:

> copymedia –l /dev/sg1 –v OPTICAL00007A –2

## Example Operations of Copymedia

### Copying a piece of media to a Manually Inserted Piece of Media (Import Slot)

One of the most common ways to create copies of media in the optical library is to import a new piece of media into the import/export slot of the library and run the *copymedia* command.  With the right command entered, *copymedia* will use the new media in the import slot to create the copy.  You will need to do the following steps:

1. Determine the address of the import slot of the library.  For an ASACA library, that address is always 128.  You can verify this with the *mcstat* command as shown below

```
[root@osvault ~]# mcstat
SCSI Media Changer Status Command
Medium changer found on /dev/sg1
Vendor ASACA
Product AM250PD
Version 2.2
Power-On, Reset or Bus Device Reset
   2 transports starting at 1
   250 storage elements starting at 4096
   1 data devices starting at 64
   1 import slots starting at 128
[root@osvault ~]#
```

2. Place a piece of media into the import slot.  The media must be physically formatted prior to use (check with your supplier to ensure that you are purchasing pre-formatted media).  See the library operations manual on the procedure to open and close the import/export door of your library.
3. Select the piece of original media you wish to make a copy of.  Generally, media copies aren't made until the original in the library is full.  You can see the status and remaining space (Free_Space) of the media in the library either in the web management interface of the OSVault system or via the *listmedia* command line program.
4. Run the copymedia command to copy the original media  to the media in the import slot.  This process can take 30 to 90 minutes depending on your optical drives and the media used.  The command would be similar to this:
   copymedia –l /dev/sg1 –v OPTICAL00003A –s 128
5. Take the copied media out of the import/export slot, manually mark the volume name on the media and place in a storage location.

## Using the Copy Pool in the Library to Create a Media Copy

Since a set of media in the optical library can be set aside as a copy pool, you can tell the *copymedia* command to run and not specify which piece of media to use for the copy. *Copymedia* will then select an unused piece of media from the copy pool and use that media for the copy.  After the copy is completed, the copy media is returned to its original slot and the OSVault database is updated so that the copy media is not used for copies of other volumes.
If a request to copy the same original volume is run again, *copymedia* will select the same copy media from the storage pool for the subsequent copies.
To run a *copymedia* from the copy pool,  follow these steps:
1. Select the piece of original media you wish to make a copy of.  Generally, media copies aren't made until the original in the library is full.  You can see the status and remaining space (Free_Space) of the media in the library either

in the web management interface of the OSVault system or via the *listmedia* command line program.
2. Run the *copymedia* command and do not specify any slot to use for the copy. Use a command similar to the following:

   copymedia –l /dev/sg1 –v OPTICAL00003A
3. The *copymedia* program will mount the volume called OPTICAL00003A into a drive, copy its contents to a temporary location on hard disk, then mount a piece of media from the copy pool range and copy the temporary location onto that media. The copy media is then returned to its original storage slot.

## *Replacing Individual Media in the Copy Pool*

Periodically, you may wish to remove media that has been copied and is stored in the media pool. You may wish to replace it with blank media for other copies or to just store that copy in another location. Unless you tell OSVault otherwise, OSVault will continue to consider that the piece of media stored in a slot in the copy pool is still there. Described here is a procedure to remove a previously written copy media from the copy pool and replace it with a blank piece of media:

1. Determine, using the listcopymedia, which piece of media you wish to remove from the optical library. Make a note of the slot number that the media is in so that you can find that piece of media. An example listing from listcopymedia is given below:

```
[[root@osvault ~]# listcopymedia
+--------------------+------+-----+--------------+----------+-------+----------+-----------+
| Label              | Slot | Side | LastAccess   | Status   | Error | Magazine | LibNum |
+--------------------+------+-----+--------------+----------+-------+----------+-----------+
| OPTICAL00003A | 4100 | A   |              | resident |       |          |    0   |
| --UNUSED--       | 4101 | A   |              | resident |       |          |    0   |
| --UNUSED--       | 4102 | A   |              | resident |       |          |    0   |
+--------------------+------+-----+--------------+----------+-------+----------+-----------+
```

2. Using the library web interface or using the mm command, move the desired piece of media to the import export slot and remove it. In the above example, to remove the copy of OPTICAL00003A in slot 4100, you can use the command

   mm 4100 128 0 0 /dev/sg1

   This would apply to an ASACA library.
3. Place a new piece of media in the import/export slot and move it into the recently vacated storage slot. In our example, that command would be:

   mm 128 4100 0 0 /dev/sg1
4. Now issue the following command to mark the new media as available for use by any copymedia command:

   mysql –e "update archive.copy_media set Label='—UNUSED—' where Slot=4100"
5. Make sure to use the "double-quote" character and the "single-quote" characters in the above command exactly as shown.
6. After these steps, verify the change by running listcopymedia again, as shown:

```
[[root@osvault ~]# listcopymedia
+----------------------+------+-----+---------------+----------+-------+----------+-----------+
| Label                | Slot | Side| LastAccess    | Status   | Error | Magazine | LibNum    |
+----------------------+------+-----+---------------+----------+-------+----------+-----------+
| --UNUSED--           | 4100 | A   |               | resident |       |          |     0     |
| --UNUSED--           | 4101 | A   |               | resident |       |          |     0     |
| --UNUSED--           | 4102 | A   |               | resident |       |          |     0     |
+----------------------+------+-----+---------------+----------+-------+----------+-----------+
```

## *Media Copy Times*

The exact amount of time it takes to copy a given piece of media varies, but here are some estimates based on various testing that may help with your planning. Doing a one drive copy of SONY ProData media with 23GByte capacity takes approximately two hours to copy.  This two hours can be broken down into approximately 40 minutes to read the media onto temporary hard disk space at 8 to 10 Mbytes per second, and approximately 88 minutes to write the data out to the copy media at 4 Mbytes per second. Writes speeds are ½ read speeds due to a verification pass that is performed after every output operation to ensure data integrity.   Blu-Ray media runs at approximately the same transfer rates (slightly slower read speeds) for 25GByte media.  With 50 GByte media, you can expect a full one drive media copy to take 4 hours to complete.
Performing a two drive media copy operation runs about 2/3 the time, so a full copy of a 50GByte Blu-Ray media will take about 3 hours to complete.