

# Using DAT tapes for data storage

## Introduction

DAT tapes are 4mm-wide magnetic tapes for high capacity data storage. They were originally designed as digital audio tapes but most DAT tapes now are in DDS (digital data storage) format. Their main advantages are their high capacity and low cost.

There are several DDS standards, listed in the table below. The ITS has a DDS-3 DAT drive attached to the Unix workstation called *corvus*, which is located in CM131, and DDS-3 tapes for this drive can be purchased from the Helpdesk.

This InfoSheet describes how to use the DDS-3 drive on *corvus*. You may also have access to tapes in other DDS formats or to other DAT drives. DAT drives for each DDS standard are backwards compatible, so a DDS-2 tape can be used, for example, in a DDS-3 tape drive. However, using older-standard tapes in a higher-standard drive can cause excessive wear and is not recommended.

Standard	Capacity (Gb) <sup>1</sup>	Approx. cost (£)
DDS-1	2	--
DDS-2	4	3.50
DDS-3	12	7.00
DDS-4	20	15.00

<sup>1</sup>Manufacturers also quote twice these capacities for storage using data compression.

## Writing a single backup file to a DAT tape

- 1 Log in to *corvus*.
- 2 Hold your DAT tape such that the side with writing faces upwards and the edge with hinged parts is away from you.
- 3 Insert the tape into the tape drive. The green light will flash while the tape is loaded.
- 4 Move to the directory above the one that you want to back up. For example, if

you want to back up a directory called */tmpshare/dxy3abc/mydata*, move to */tmpshare/dxy3abc* by typing:

```
cd /tmpshare/dxy3abc
```

- 5 To create the backup, use the *tar* (tape archive) command, e.g:

```
tar cv mydata
```

In this command, **tar** is used with the **c** option to create an archive. The **v** option causes **tar** to operate in **verbose** mode, so that you can see the names and sizes of the files that you back up. In the example, **tar** creates an archive of the directory called *mydata*, including all files and subdirectories within *mydata*. *Tar* can be used to create an archive of a directory tree, a single file or a list of files and directories.

A large backup may take some time. Once the **tar** command has finished, the tape will rewind automatically. Do not attempt to write another backup at this point or you will overwrite the first one.

- 6 To check what has been written on the tape, create a verbose table of the tape contents by typing:

```
tar tv
```

- 7 It is useful to save the tape listing for future reference, e.g. by re-directing the output from **tar tv** to a file:

```
tar tv > mytape.lis
```

The tape will rewind when the command has finished.

- 8 To eject the tape, type:

```
mt offline
```

## Reading a tar file from a DAT tape

- 1 Login to *corvus* and insert the tape into the tape drive as described above.
- 2 Move to the directory in which you wish to write the contents of the tape.
- 3 Before you continue, it is important to establish the directory structure in the tar file on tape, which will be

reproduced exactly when you extract the files. To list a table of the tar file's contents, type:

```
tar tv
```

The tape will rewind when the command has finished.

- 4 To extract the contents of the tar file, type:

```
tar xv
```

Note: if you want to extract just one file, type:

```
tar xv pathtofile
```

where *pathtofile* is the path to the file, exactly as it appears in the output from **tar tv**.

The tape will rewind when each **tar** command has finished.

- 5 When you are ready to eject the tape, type:

```
mt offline
```

Note: if no tar file is found, an error message will be displayed:

```
tar: blocksize = 0
```

## Notes and warnings

It is very easy to overwrite the contents of a tape so use the write-protect tab to protect tapes with important data. The tab is located on the edge that faces outwards when the tape is in the drive and the tape is protected when the hole is uncovered.

If you attempt to write to a tape that is write-protected, a message similar to the following will be displayed:

```
tar: /dev/rmt/0: Permission denied
```

Make sure that your data will fit on the tape. With the default setup, a tape that runs to the end will rewind and then overwrite the beginning of the tape. (For a workaround, see the discussion of **\$TAPE**, below).

Do not re-use a DAT tape endlessly. They are suitable for backups and for transporting data to another computer but, like audio tapes, may eventually cause problems if they are used many times or are stored carelessly.

Use relative paths when you create a tape archive so that the files can be unpacked to another location if necessary.

The command **mt status** is useful to check whether a tape is loaded, especially when the tape drive is attached to a remote or multi-user computer.

If you have access to a DAT drive on a computer on which many people may be

working at the same time, be aware that all of those users potentially have access to the DAT drive. This means:

- Be careful not to write to another person's tape by mistake, especially when using the **tar** command.
- Write-protect your tapes when you are reading data.
- Label your tapes clearly.

It is possible to write multiple tar files to a tape but this is not recommended except for experienced users. If you receive a tape that has been written in this way, please contact the Helpdesk.

## \$TAPE settings

If more than one tape drive is attached to a machine, an environment variable called **\$TAPE** governs which drive you will work with. It also controls the behaviour of the tape commands. To check the value of **\$TAPE**, type:

```
echo $TAPE
```

The ITS system-wide login procedure leaves **\$TAPE** unset. In this case you will use the default (**/dev/rmt/0**) which means that:

- the device is a DAT drive
- it uses standard data compression
- the tape rewinds after each command.

A common alternative is to type:

```
setenv TAPE /dev/rmt/0n
```

where the **n** stands for **no** rewind and prevents the tape from rewinding after each command. This can be faster for certain operations and is essential if there are multiple files on the tape. To rewind the tape you will need to type

```
mt rewind
```

This setting also causes the tape to eject rather than rewind if the end of the tape is reached during an operation.

Other settings for **\$TAPE** are available but are not recommended for writing tapes. If you receive a tape that has been written with a different setting, consult the information on device options given by typing:

```
man st
```

## More information

For more information, please read the man pages for the commands **tar** and **mt**, or contact the ITS Helpdesk.