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Linux Tape Backup With mt And tar Command Howto

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[1]

Magnetic tape is a non-volatile storage medium consisting of a magnetic coating on a thin plastic strip. Nearly all recording tape is of this type, whether used for video, audio storage or general purpose digital data storage using a computer. How do I make backup using tapes under Linux operating systems?

Linux (and other Unixish system) use mt command to control magnetic tape drive operation. You need to use mt command while working with tape drive. It allows you to reading and writing to tape.

The default tape drive under Linux is /dev/st0 (first SCSI tape device name). You can read more about tape drives [naming convention used under Linux here](#) ^[2]. Following paragraph summaries command you need to use control tape drive for backup/restore purpose.

Rewind tape drive:

```
# mt -f /dev/st0 rewind
```

Backup directory /www and /home with tar command (z - compressed):

```
# tar -czf /dev/st0 /www /home
```

Find out what block you are at with mt command:

```
# mt -f /dev/st0 tell
```

Display list of files on tape drive:

```
# tar -tzf /dev/st0
```

Restore /www directory:

```
# cd /  
# mt -f /dev/st0 rewind  
# tar -xzf /dev/st0 www
```

Unload the tape:

```
# mt -f /dev/st0 offline
```

Display status information about the tape unit:

```
# mt -f /dev/st0 status
```

Erase the tape:

```
# mt -f /dev/st0 erase
```

You can go BACKWARD or FORWARD on tape with mt command itself:

(a) Go to end of data:

```
# mt -f /dev/nst0 eod
```

(b) Goto previous record:

```
# mt -f /dev/nst0 bsfm 1
```

(c) Forward record:

```
# mt -f /dev/nst0 fsf 1
```

Replace /dev/st0 with your actual tape drive name.

Linux Tape Backup Example

To backup to multiple tape use the following command (backup /home file system):

```
# tar -clpMzvf /dev/st0 /home
```

To compare tape backup, enter:

```
# tar -dlpMzvf /dev/st0 /home
```

To restore tape in case of data loss or hard disk failure:

```
# tar -xlpMzvf /dev/st0 /home
```

Where,

- **d** : find differences between archive and file system
- **x** : extract files from an archive
- **l** : list the contents of an archive
- **p** : ignore umask when extracting files
- **M** : create/list/extract multi-volume archive (multiple tapes)
- **z** : Compress backup using gzip
- **v** : verbosely list files processed
- **f/dev/st0** : Tape device name
- **/home** : Backup /home file system

Putting it all tougher

```
#!/bin/bash
# A UNIX / Linux shell script to backup dirs to tape device like /dev/st0 (linux)
# This script make both full and incremental backups.
# You need at two sets of five tapes. Label each tape as Mon, Tue, Wed, Thu and Fri.
# You can run script at midnight or early morning each day using cronjans.
# The operator or sys admin can replace the tape every day after the script has done.
# Script must run as root or configure permission via sudo.
# -----
# Copyright (c) 1999 Vivek Gite <vivek@nixcraft.com>
# This script is licensed under GNU GPL version 2.0 or above
# -----
# This script is part of nixCraft shell script collection (NSSC)
# Visit http://bash.cyberciti.biz/ for more information.
# -----
# Last updated on : March-2003 - Added log file support.
# Last updated on : Feb-2007 - Added support for excluding files / dirs.
# -----
LOGBASE=/root/backup/log

# Backup dirs; do not prefix /
BACKUP_ROOT_DIR="home sales"

# Get todays day like Mon, Tue and so on
NOW=$(date +%a)

# Tape devie name
TAPE="/dev/st0"

# Exclude file
TAR_ARGS=""
EXCLUDE_CONF=/root/.backup.exclude.conf

# Backup Log file
LOGFILE=$LOGBASE/$NOW.backup.log

# Path to binaries
TAR=/bin/tar
MT=/bin/mt
MKDIR=/bin/mkdir

# -----
# Excluding files when using tar
# Create a file called $EXCLUDE_CONF using a text editor
# Add files matching patterns such as follows (regex allowed):
# home/vivek/iso
```

```
# home/vivek/*.cpp~
# -----
[ -f $EXCLUDE_CONF ] && TAR_ARGS="-X $EXCLUDE_CONF"

#### Custom functions ####
# Make a full backup
full_backup() {
    local old=$(pwd)
    cd /
    $TAR $TAR_ARGS -cvpf $TAPE $BACKUP_ROOT_DIR
    $MT -f $TAPE rewind
    $MT -f $TAPE offline
    cd $old
}

# Make a partial backup
partial_backup() {
    local old=$(pwd)
    cd /
    $TAR $TAR_ARGS -cvpf $TAPE -N "$(date -d '1 day ago')" $BACKUP_ROOT_DIR
    $MT -f $TAPE rewind
    $MT -f $TAPE offline
    cd $old
}

# Make sure all dirs exists
verify_backup_dirs() {
    local s=0
    for d in $BACKUP_ROOT_DIR
    do
        if [ ! -d /$d ];
        then
            echo "Error : /$d directory does not exists!"
            s=1
        fi
    done
    # if not; just die
    [ $s -eq 1 ] && exit 1
}

#### Main logic ####

# Make sure log dir exists
[ ! -d $LOGBASE ] && $MKDIR -p $LOGBASE

# Verify dirs
verify_backup_dirs

# Okay let us start backup procedure
# If it is monday make a full backup;
# For Tue to Fri make a partial backup
# Weekend no backups
case $NOW in
    Mon) full_backup;;
    Tue|Wed|Thu|Fri) partial_backup;;
    *) ;;
esac > $LOGFILE 2>&1
```

Customize above shell script as per your needs and setup a [cron job](#) ^[3] to execute it:

```
@midnight /path/to/tapebackup.sh
```

See also:

- [Howto - Use tar command through network over ssh session \(i.e. writing to tape on a remote Linux server system\)](#) ^[4]
- [Download : Linux / UNIX Tar Full](#) ^[5] and Incremental Tape Backup Shell Script
- This small how-to covered all options used in day today life; however, it is highly recommended that you go

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URLs in this post:

[1] Image: <http://www.cyberciti.biz/faq/faq/category/linux/>

[2] naming convention used under Linux here: <http://www.cyberciti.biz/faq/tape-drives-naming-convention-under-linux/>

[3] cron job: <http://www.cyberciti.biz/faq/how-do-i-add-jobs-to-cron-under-linux-or-unix-oses/>

[4] Howto - Use tar command through network over ssh session (i.e. writing to tape on a remote Linux server system): <http://www.cyberciti.biz/faq/howto-use-tar-command-through-network-over-ssh-session/>

[5] Download : Linux / UNIX Tar Full: <http://bash.cyberciti.biz/backup/tar-full-incremental-tape-backup-script/>

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