How to Set Up Virtual Tapes?

Introduction:

Tapes drives have been one of the most cost-effective backup solutions to store data till date. Lately, disk-based backups are gaining huge demand and popularity due to lesser requirement of manual involvement. With tape cartridges failing often during restore and backup process, VTL (Virtual tape library) is gaining more momentum. It is not always possible to have physical devices in lab for testing. Luckily, in case of tape drives, we can simulate actual tape drives using virtual tapes. When it comes to VTL's there are a few options ranging from open source options to options that cost thousands of dollars. mhVTL is one of the most popular open-source VTL available.

Step 1: Install Dependencies

- Login/SSH into the server where you wish to install Virtual tapes.
- Update the existing packages and kernel using the following command:

    yum upgrade -y


```
root@devlab2-centos7 ~]# yum upgrade -y
oaded plugins: fastestmirror
oading mirror speeds from cached hostfile
* base: mirrors.usinternet.com
* extras: repos-tx.psychz.net
* updates: mirrors.xmission.com
ase                                                              | 3.6 kB  00:00:00
xtras                                                            | 3.4 kB  00:00:00
pdates                                                           | 3.4 kB  00:00:00
[[2~Resolving Dependencies
-> Running transaction check
--> Package audit.x86_64 0:2.8.1-3.el7 will be updated
--> Package audit.x86_64 0:2.8.1-3.el7_5.1 will be an update
--> Package audit-libs.x86_64 0:2.8.1-3.el7 will be updated
--> Package audit-libs.x86_64 0:2.8.1-3.el7_5.1 will be an update
--> Package bind-libs-lite.x86_64 32:9.9.4-61.el7 will be updated
--> Package bind-libs-lite.x86_64 32:9.9.4-61.el7_5.1 will be an update
--> Package bind-license.noarch 32:9.9.4-61.el7 will be updated
--> Package bind-license.noarch 32:9.9.4-61.el7_5.1 will be an update
--> Package centos-release.x86_64 0:7-5.1804.el7.centos.2 will be updated
--> Package centos-release.x86_64 0:7-5.1804.5.el7.centos will be an update
--> Package dracut.x86_64 0:033-535.el7 will be updated
```

- To install virtual tapes the following packages are to be installed:
    - Development tools
    - lzo
    - wget
    - mtx
    - lsscsi
    - sg3_utils
    - kernel-devel
- The packages listed above can be installed using the following commands:
    - development tools:

        yum groupinstall "Development Tools" –y

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```
[root@devlab2-centos7 ~]# yum groupinstall "Development Tools" -y
Loaded plugins: fastestmirror
There is no installed groups file.
Maybe run: yum groups mark convert (see man yum)
Loading mirror speeds from cached hostfile
 * base: mirrors.usinternet.com
 * extras: repos-tx.psychz.net
 * updates: mirrors.xmission.com
Resolving Dependencies
--> Running transaction check
---> Package autoconf.noarch 0:2.69-11.el7 will be installed
--> Processing Dependency: m4 >= 1.4.14 for package: autoconf-2.69-11.el7.noarch
--> Processing Dependency: perl(Data::Dumper) for package: autoconf-2.69-11.el7.noarch
---> Package automake.noarch 0:1.13.4-3.el7 will be installed
--> Processing Dependency: perl(Thread::Queue) for package: automake-1.13.4-3.el7.noarch
```

- o lzo:

   yum install lzo –y

```
[root@devlab2-centos7 ~]# yum install lzo -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirrors.usinternet.com
 * extras: repos-tx.psychz.net
 * updates: mirrors.tummy.com
```

- o wget:

   yum install wget –y

```
[root@devlab2-centos7 ~]# yum install wget -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirrors.usinternet.com
 * extras: repos-tx.psychz.net
 * updates: mirrors.tummy.com
Resolving Dependencies
--> Running transaction check
---> Package wget.x86_64 0:1.14-15.el7_4.1 will be installed
```

- o mtx:

   yum install mtx –y

```
Complete!
[root@devlab2-centos7 ~]# yum install mtx -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirrors.usinternet.com
 * extras: repos-tx.psychz.net
 * updates: mirrors.tummy.com
```

- o Lsscsi:

   yum install lsscsi –y

```
Complete!
[root@devlab2-centos7 ~]# yum install lsscsi -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirrors.usinternet.com
 * extras: repos-tx.psychz.net
 * updates: mirrors.tummy.com
Package lsscsi-0.27-6.el7.x86_64 already installed and latest version
Nothing to do
[root@devlab2-centos7 ~]#
```

- o sg3_utils:

   yum install sg3_utils –y

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```
[root@devlab2-centos7 ~]# yum install sg3_utils -y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirrors.usinternet.com
 * extras: repos-tx.psychz.net
 * updates: mirrors.tummy.com
Resolving Dependencies
--> Running transaction check
---> Package sg3_utils.x86_64 0:1.37-12.el7 will be installed
--> Processing Dependency: sg3_utils-libs = 1.37-12.el7 for package: sg3_utils-1.37-12.el7.x86_64
```

o   kernel-devel:

yum install "kernel-devel-uname-r == $(uname -r)" –y

```
Complete!
[root@devlab2-centos7 ~]# yum install "kernel-devel-uname-r == $(uname -r)" –y
Loaded plugins: fastestmirror
Loading mirror speeds from cached hostfile
 * base: mirror.hackingand.coffee
 * extras: repos-tx.psychz.net
 * updates: mirrors.tummy.com
```

Step 2: Download mhVTL

- mhVTL packages can be found at http://www.mhvtl.com/download/
- Download the packages using the following commands:

    wget http://www.mhvtl.com/downloads/mhvtl-utils-1.5-4.x86_64.rpm

```
Complete!
[root@devlab2-centos7 ~]# wget http://www.mhvtl.com/downloads/mhvtl-utils-1.5-4.x86_64.rpm
--2018-11-28 02:34:29--  http://www.mhvtl.com/downloads/mhvtl-utils-1.5-4.x86_64.rpm
Resolving www.mhvtl.com (www.mhvtl.com)... 103.18.109.178, 2407:e700:2:10::13a
Connecting to www.mhvtl.com (www.mhvtl.com)|103.18.109.178|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 457315 (447K) [application/octet-stream]
Saving to: 'mhvtl-utils-1.5-4.x86_64.rpm'

8% [=======>                                                       ] 39,096      111KB/s
```

    wget http://www.mhvtl.com/downloads/mhvtl-utils-1.5-4.src.rpm

```
[root@devlab2-centos7 ~]# wget http://www.mhvtl.com/downloads/mhvtl-utils-1.5-4.src.rpm
--2018-11-28 02:34:46--  http://www.mhvtl.com/downloads/mhvtl-utils-1.5-4.src.rpm
Resolving www.mhvtl.com (www.mhvtl.com)... 103.18.109.178, 2407:e700:2:10::13a
Connecting to www.mhvtl.com (www.mhvtl.com)|103.18.109.178|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 302876 (296K) [application/octet-stream]
Saving to: 'mhvtl-utils-1.5-4.src.rpm'

12% [==========>                                                   ] 39,096      108KB/s
```

Step 3: Install mhVTL

- Install the rpm package using:

    rpm -Uvh mhvtl-utils-1.5-4.x86_64.rpm mhvtl-utils-1.5-4.src.rpm

- Use the following commands to build the kernel module:

    cd /root/rpmbuild/SOURCES/

    tar xvfz mhvtl-2016-03-10.tgz

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```
[root@devlab2-centos7 SOURCES]# tar xvfz mhvtl-2016-03-10.tgz
mhvtl-1.5/man/
mhvtl-1.5/man/vtltape.1.in
mhvtl-1.5/man/mktape.1.in
mhvtl-1.5/man/edit_tape.1.in
mhvtl-1.5/man/vtllibrary.1.in
mhvtl-1.5/man/build_library_config.1.in
mhvtl-1.5/man/mhvtl.conf.5.in
mhvtl-1.5/man/mhvtl.1.in
mhvtl-1.5/man/library_contents.5.in
mhvtl-1.5/man/make_vtl_media.1.in
mhvtl-1.5/man/vtlcmd.1.in
mhvtl-1.5/man/device.conf.5.in
mhvtl-1.5/man/Makefile
```

cd mhvtl-1.5/kernel/

make

make install

```
[root@devlab2-centos7 SOURCES]# cd mhvtl-1.5/kernel/
[root@devlab2-centos7 kernel]# make
make -C /lib/modules/3.10.0-862.9.1.el7.x86_64/build SUBDIRS=/root/rpmbuild/SOURCES/mhvtl-1.5/kernel modules
make[1]: Entering directory `/usr/src/kernels/3.10.0-862.9.1.el7.x86_64'
  CC [M]  /root/rpmbuild/SOURCES/mhvtl-1.5/kernel/mhvtl.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC      /root/rpmbuild/SOURCES/mhvtl-1.5/kernel/mhvtl.mod.o
  LD [M]  /root/rpmbuild/SOURCES/mhvtl-1.5/kernel/mhvtl.ko
make[1]: Leaving directory `/usr/src/kernels/3.10.0-862.9.1.el7.x86_64'
[root@devlab2-centos7 kernel]# make install
install -o root -g root -m 644 mhvtl.ko /lib/modules/`uname -r`/kernel/drivers/scsi/; \
depmod -a; \
if [ -f "/etc/modprobe.d/unsupported-modules" ]; then \
        sed -i 's/^allow_unsupported_modules 0/allow_unsupported_modules 1/' /etc/modprobe.d/unsupported-modules; \
fi
```

Step 3: Start and verify the mhVTL installation

- To start the mhVTL service use the following command:

  /etc/init.d/mhvtl start

```
[root@devlab2-centos7 kernel]# /etc/init.d/mhvtl start

Could not locate library config file: /etc/mhvtl/library_contents.10
Creating a default one
Please stop mhvtl & edit /etc/mhvtl/library_contents.10 to suit your requirements

Could not locate library config file: /etc/mhvtl/library_contents.30
Creating a default one
Please stop mhvtl & edit /etc/mhvtl/library_contents.30 to suit your requirements
vtllibrary process PID is 73821
vtllibrary process PID is 73824
[root@devlab2-centos7 kernel]#
```

- To verify if the installation was successful use the following:

  lsscsi

```
[root@devlab2-centos7 kernel]# lsscsi
[0:0:0:0]    disk    VMware   Virtual disk     2.0   /dev/sda
[33:0:0:0]   mediumx STK      L700             0105  /dev/sch0
[33:0:1:0]   tape    IBM      ULT3580-TD5      0105  /dev/st0
[33:0:2:0]   tape    IBM      ULT3580-TD5      0105  /dev/st1
[33:0:3:0]   tape    IBM      ULT3580-TD4      0105  /dev/st2
[33:0:4:0]   tape    IBM      ULT3580-TD4      0105  /dev/st3
[33:0:8:0]   mediumx STK      L80              0105  /dev/sch1
[33:0:9:0]   tape    STK      T10000B          0105  /dev/st4
[33:0:10:0]  tape    STK      T10000B          0105  /dev/st5
[33:0:11:0]  tape    STK      T10000B          0105  /dev/st6
[33:0:12:0]  tape    STK      T10000B          0105  /dev/st7
[root@devlab2-centos7 kernel]#
```

- To set the mhVTL service to start on boot run the following command:

  chkconfig mhvtl on

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Conclusion:

So, next time when you think of tape libraries, choose easy to manage, fast and relatively green VTL's. Additionally, they are scalable provide faster backup and recovery, and reduce the operating costs too. Zmanda, an enterprise software provides 24×7 support worldwide. You can use the VTL's to test Zmanda and decide yourself if it fits your requirements.

Please follow the above steps to install VTL using the mhVTL library on CentOS 6 and CentOS 7. In case you are stuck while installing the VTL's, kindly contact us and our team will get back to you soon.

You can reach us @ Zsupport@betsol.com.

Or call us @ 888-496-2632 (U.S.)/ 408-732-3208 (INTL).