## **THE GEEK DIARY** How To Delete Files on a ZES-Feilesystem that is 100% Full

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The Total Economic Impact of mixpanel + Forrester Mixpanel by Forrester Research

When a ZFS file system has no space left then the deletion of files can fail with "**disk quota exceeded**". The post provides different ways to create free space to overcome the situation.

# 1. Truncating files

If the files can not be removed directly, we can first truncate them and then delete them.

# cat /dev/null > /file/to/delete
# rm /file/to/delete

Alternatives: there are other options to free up space in the zpool, e.g.

- 1. increase the quota if there is space in the zpool left
- 2. Shrink the size of a zvol
- 3. temporarily destroy a dump device (if the rpool is affected)
- 4. delete unused snapshots
- 5. increase the space in the zpool by enlarging a vdev or adding a vdev
- 6. Temporarily decrease refreservation of a ZVol
- 7. Rolling back the log

#### 2. Increasing the quota

You can check the current quota with

# zfs get quota {filesystem}
# zfs get refquota {filesystem}

If the quota is set then you can increase it with

# zfs set quota={value} {dataset}
# zfs set refquota={value} {dataset}

## 3. Shrink the size of a zvol

If the zvol of the affected zpool has some space left then it can be shrinked.

# zfs set volsize=[newsize] ZPOOL/ZVOL

For the rpool and its dump zvol it looks like this:

# zfs set volsize=[newsize] rpool/dump

## 4. Destroying a dump device on an rpool (or an unused zvol)

The rpool's dump device can temporarily be destroyed, as it is used for storing a livedump ("savecore -L") or a crash dump in case of a panic.

# dumpadm	
Dump content :	kernel with ZFS metadata
Dump device :	/dev/zvol/dsk/rpool/dump (dedicated)
Savecore directory:	/var/crash
Savecore enabled :	yes
Save compressed :	on

You can inspect all zvols with

# zfs list -t	volume			
NAME	USED	AVAIL	REFER	MOUNTPOINT
rpool/dump	5.16G	11.4G	4.00G	-
rpool/swap	2.06G	10.3G	2.00G	-
rpool/testvol	103M	10.3G	8.13M	-

# zfs list	rpool/d	ump			
NAME	USED	AVAIL	REFER	MOUNTPOINT	
rpool/dump	5.16G	11.4G	4.00G	-	

Please note the volsize for the re-creation of the zvol later on; in this case 4 GB of space can be created by destroying the zvol.

```
# zfs destroy rpool/dump
```

Later you can re-create the zvol with (note that the size of 4 GB is used here according to the example; specify the volsize you saw in your output of "zfs get volsize rpool/dump"):

# zfs create -V 4g rpool/dump

## 5. Delete unused snapshots

List the snapshots with

# zfs list -t snapshot

You can sort the output; here the "used" property is used:

You can see the contents of a snapshot; there is a special directory ".zfs/snapshot" directory in the root of the file system. By default the directory ".zfs" is hidden. You need to change the property "snapdir" to see the directory:

# zfs set snapdir=visible {filesystem}

Now you can change to the directoy /{filesystem}/.zfs/snapshot with cd(1) and inspect the contents. Then decide which snapshot you do not need and delete it with

# zfs destroy {snapshot}

#### 6. Increase the space in the zpool by enlarging a vdev or adding a vdev

You can add another vdev to the zpool to make it bigger. If your zpool consists of raidzN vdevs please make sure that you add another raidzN vdevs. If you would erroneously add a single vdev then your zpool is no longer fully redundant; you could attach another vdev to have a mirror added to the raidzN vdevs and have another type of redundancy. But if you make a mistake then this can just be corrected by re-creating the whole zpool.

You can grow a vdev by growing the underlying LUN or make the partition larger. Please make sure that the following property is set for the zpool:

# zpool get autoexpand {zpool}
# zpool set autoexpand=on {zpool}

This way ZFS will detect changes in the size of the used storage devices and will propagate the change to the vdev.

### 7. Temporarily decrease refreservation of a ZVol

Temporarily decrease the refreservation of any zvols that are not using all of their reserved space. This frees space within the zpool to allow a more permanent solution to be implemented, before the refreservation is restored to its original value.

List the zvols:

# zfs list	-t vol		
NAME	PROPERTY	VALUE	SOURCE
rpool/dump	referenced	4.00G	-
rpool/dump	refreservation	5.16G	local

Select a zvol and display its current refreserv and usedbyrefreserv:

# zfs get refreservation,usedbyrefreservation rpool/dump NAME PROPERTY VALUE SOURCE rpool/dump refreservation 5.16G local rpool/dump usedbyrefreservation 1.16G -

Decrease the refreserv:

# zfs set refreservation=5.0G rpool/dump

Note: 'refreservation' may be greater than necessary. You can use 'auto' to reserve enough space for a nonsparse volume. After you successfully deleted the data restore the refreservation back to the original value, here:

```
# zfs set refreservation=5.16G rpool/dump
```

Note: 'refreservation' may be greater than necessary. You can use 'auto' to reserve enough space for a nonsparse volume.

### 8. Rolling back the log

If the import of a zpool fails due to "out of space" then you can import with rolling the log back to the previous commit to the log; however all updates to the filesystem after that commit was made are lost. You can achieve this by

# zpool import -F ZPOOLNAME

It will tell you the point in time to which the log was rolled back, e.g.:

# zpool import -F rpool

Pool rpool returned to its state as of Thu Jun 09 07:12:01 2016. If you just want to check whether this is possible then you can do

# zpool import -Fn ZPOOLNAME



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Solaris Volume Manager (SVM) command line reference (https://www.thegeekdiary.com/solaris-volume-manager-svmcommand-line-reference-cheat-sheet/)

Solaris ZFS command line reference (https://www.thegeekdiary.com/solaris-zfs-command-line-reference-cheat-sheet/)

RHEL 7 – RHCSA Notes (Cheat Sheets) (https://www.thegeekdiary.com/rhel-7-rhcsa-notes-cheat-sheets/)

CentOS / RHEL 7 : firewalld Cheat Sheet (https://www.thegeekdiary.com/centos-rhel-7-firewalld-command-line-referencecheat-sheet/)

systemd command line reference (cheat sheet) (https://www.thegeekdiary.com/centos-rhel-7-systemd-command-linereference-cheat-sheet/)

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The ultimate Solaris Volume Manager (SVM) interview questions (https://www.thegeekdiary.com/the-ultimate-solaris-volume-manager-svm-interview-questions/)

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