



# How tree quotas work

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# How tree quotas work

## Overview of how tree quotas work

You can create a quota with a qtree as its target to limit how large the target qtree can become. These quotas are also called *tree quotas*.



You can also create user and group quotas for a specific qtree. In addition, quotas for a FlexVol volume are sometimes inherited by the qtrees contained by that volume.

When you apply a quota to a qtree, the result is similar to a disk partition, except that you can change the qtree's maximum size at any time by changing the quota. When applying a tree quota, ONTAP limits the disk space and number of files in the qtree, regardless of their owners. No users, including root and members of the BUILTIN\Administrators group, can write to the qtree if the write operation causes the tree quota to be exceeded.

The size of the quota does not guarantee any specific amount of available space. The size of the quota can be larger than the amount of free space available to the qtree. You can use the `volume quota report` command to determine the true amount of available space in the qtree.

Learn more about `volume quota report` in the [ONTAP command reference](#).

## How user and group quotas work with qtrees

Tree quotas limit the overall size of the qtree. To prevent individual users or groups from consuming the entire qtree, you specify a user or group quota for that qtree.

### Example user quota in a qtree

Suppose you have the following quota rules:

```
cluster1::> volume quota policy rule show -vserver vs0 -volume vol1

Vserver: vs0          Policy: default          Volume: vol1
                                         User          Disk          Disk          Soft          Soft
                                         Mapping       Limit        Limit        Files        Files
Type   Target     Qtree      User      Mapping     Limit      Limit      Limit      Limit
Threshold
-----  -----  -----  -----  -----  -----  -----  -----  -----  -----
-----  -----
user   ""        ""        off        50MB      -         -         -         -
45MB
user   jsmith    ""        off        80MB      -         -         -         -
75MB
```

You notice that a certain user, kjones, is taking up too much space in a critical qtree, proj1, which resides in vol1. You can restrict this user's space by adding the following quota rule:

```
cluster1::> volume quota policy rule create -vserver vs0 -volume vol1  
-policy-name default -type user -target "kjones" -qtree "proj1" -disk  
-limit 20m -threshold 15m
```

```
cluster1::> volume quota policy rule show -vserver vs0 -volume vol1
```

Vserver: vs0			Policy: default			Volume: vol1		
Type	Target	Qtree	User Mapping	Disk Limit	Disk Limit	Files Limit	Files Limit	
Threshold								
user	""	""	off	50MB	-	-	-	
45MB								
user	jsmith	""	off	80MB	-	-	-	
75MB								
user	kjones	proj1	off	20MB	-	-	-	
15MB								

## How default tree quotas on a FlexVol volume create derived tree quotas

When you create a default tree quota on a FlexVol volume, corresponding derived tree quotas are automatically created for every qtree in that volume.

These derived tree quotas have the same limits as the default tree quota. If no additional quotas exist, the limits have the following effects:

- Users can use as much space in a qtree as they are allotted for the entire volume (provided they did not exceed the limit for the volume by using space in the root or another qtree).
- Each of the qtrees can grow to consume the entire volume.

The existence of a default tree quota on a volume continues to affect all new qtrees that are added to the volume. Each time a new qtree is created, a derived tree quota is also created.

Like all derived quotas, derived tree quotas display the following behaviors:

- Are created only if the target does not already have an explicit quota.
- Appear in quota reports but do not appear when you show quota rules with the `volume quota policy rule show` command. Learn more about `volume quota policy rule show` in the [ONTAP command reference](#).

### Example of derived tree quotas

You have a volume with three qtrees (proj1, proj2, and proj3) and the only tree quota is an explicit quota on the proj1 qtree limiting its disk size to 10 GB. If you create a default tree quota on the volume and reinitialize quotas on the volume, the quota report now contains four tree quotas:

Volume Specifier	Tree Specifier	Type	ID	----Disk----		----Files----		Quota
				Used	Limit	Used	Limit	
vol1	proj1	tree	1	0B	10GB	1	-	proj1
vol1		tree	*	0B	20GB	0	-	*
vol1	proj2	tree	2	0B	20GB	1	-	proj2
vol1	proj3	tree	3	0B	20GB	1	-	proj3
...								

The first line shows the original explicit quota on the proj1 qtree. This quota remains unchanged.

The second line shows the new default tree quota on the volume. The asterisk (\*) Quota Specifier indicates it is a default quota. This quota is a result of the quota rule that you created.

The last two lines show new derived tree quotas for the proj2 and proj3 qtrees. ONTAP automatically created these quotas as a result of the default tree quota on the volume. These derived tree quotas have the same 20-GB disk limit as the default tree quota on the volume. ONTAP did not create a derived tree quota for the proj1 qtree because the proj1 qtree already had an explicit quota.

## How default user quotas on a FlexVol volume affect quotas for the qtrees in that volume

If a default user quota is defined for a FlexVol volume, a default user quota is automatically created for every qtree contained by that volume for which an explicit or derived tree quota exists.

If a default user quota on the qtree already exists, it remains unaffected when the default user quota on the volume is created.

The automatically created default user quotas on the qtrees have the same limits as the default user quota you create for the volume.

An explicit user quota for a qtree overrides (replaces the limits applied by) the automatically created default user quota, the same way as it overrides a default user quota on that qtree that was created by an administrator.

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