



# **Cautions and considerations for changing file or directory capacity**

ONTAP 9

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# Cautions and considerations for changing file or directory capacity

## Considerations for changing the maximum number of files allowed on a FlexVol volume

FlexVol volumes have a maximum number of files that they can contain. You can change the maximum number of files for a volume, but before doing so you should understand how this change affects the volume.

If your data requires a large number of files or very large directories, you can expand ONTAP file or directory capacity. However, you should understand the limitations and caveats for doing so before proceeding.

The number of files a volume can contain is determined by how many inodes it has. An *inode* is a data structure that contains information about files. Volumes have both private and public inodes. Public inodes are used for files that are visible to the user; private inodes are used for files that are used internally by ONTAP. You can change only the maximum number of public inodes for a volume. You cannot affect the number of private inodes.

ONTAP automatically sets the maximum number of public inodes for a newly created volume based on the size of the volume: 1 inode per 32 KB of volume size. When the size of a volume is increased, either directly by an administrator or automatically by ONTAP through the autosize feature, ONTAP also increases (if necessary) the maximum number of public inodes so there is at least 1 inode per 32 KB of volume size, until the volume reaches approximately 680 GB in size.

In versions of ONTAP before 9.13.1, growing the volume greater than 680 GB in size does not automatically result in more inodes, because ONTAP does not automatically create more than 22,369,621 inodes. If you need more files than the default number for any size volume, you can use the volume modify command to increase the maximum number of inodes for the volume.

Beginning in ONTAP 9.13.1, the maximum number of inodes continues to grow so there is one inode per 32 KB of volume space even if the volume is larger than 680 GB. This growth continues until the volume reaches the inode maximum of 2,147,483,632.

You can also decrease the maximum number of public inodes. Decreasing the number of public inodes does *not* change the amount of space allocated to inodes, but it does lower the maximum amount of space the public inode file can consume. After space has been allocated for inodes, it is never returned to the volume. Therefore, lowering the maximum number of inodes below the number of inodes currently allocated does not return the space used by the allocated inodes.

### More information

- [Display file or inode usage](#)

## Cautions for increasing the maximum directory size for FlexVol volumes

You can increase the default maximum directory size for a specific FlexVol volume by using the `-maxdir-size` option of the `volume modify` command, but doing so could impact system performance. See the Knowledge Base article [What is maxdirsize?](#).

To learn more about the model-dependent maximum directory sizes for FlexVol volumes, visit the [NetApp Hardware Universe](#).

## Rules governing node root volumes and root aggregates

A node's root volume contains special directories and files for that node. The root aggregate contains the root volume. A few rules govern a node's root volume and root aggregate.

A node's root volume is a FlexVol volume that is installed at the factory or by setup software. It is reserved for system files, log files, and core files. The directory name is `/mroot`, which is accessible only through the systemshell by technical support. The minimum size for a node's root volume depends on the platform model.

- The following rules govern the node's root volume:
  - Unless technical support instructs you to do so, do not modify the configuration or content of the root volume.
  - Do not store user data in the root volume.

Storing user data in the root volume increases the storage giveback time between nodes in an HA pair.

- You can move the root volume to another aggregate.

### [Relocating root volumes to new aggregates](#)

- The root aggregate is dedicated to the node's root volume only.

ONTAP prevents you from creating other volumes in the root aggregate.

[NetApp Hardware Universe](#)

## Relocate root volumes to new aggregates

The root replacement procedure migrates the current root aggregate to another set of disks without disruption.

### About this task

You can change the location of the root volume to a new aggregate in the following scenarios:

- When the root aggregates are not on the disk you prefer
- When you want to rearrange the disks connected to the node
- When you are performing a shelf replacement of the EOS disk shelves

### Steps

1. Relocate the root aggregate:

```
system node migrate-root -node node_name -disklist disk_list -raid-type  
raid_type
```

- **-node**

Specifies the node that owns the root aggregate that you want to migrate.

- **-disklist**

Specifies the list of disks on which the new root aggregate will be created. All disks must be spares and owned by the same node. The minimum number of disks required is dependent on the RAID type.

- **-raid-type**

Specifies the RAID type of the root aggregate. The default value is `raid-dp`. This is the only type supported in advanced mode.

## 2. Monitor the progress of the job:

```
job show -id jobid -instance
```

## Results

If all of the pre-checks are successful, the command starts a root volume replacement job and exits.

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