A group's PI owns the /xdisk allocation. By default, your PI has exclusive read/write/execute privileges for the root folder /xdisk/PI.

By default, members of a research group only have write access to their subdirectories under /xdisk/PI. If they so choose, a PI may allow their group members to write directly to /xdisk/PI by running one of the following commands:

<table>
<thead>
<tr>
<th>Command</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ chmod g+r /xdisk/PI</td>
<td>Group members can see the contents of the directory with <code>ls</code>, but may not access it or make modifications (e.g. add, delete, or edit files/directories)</td>
</tr>
<tr>
<td>$ chmod g+rx /xdisk/PI</td>
<td>Group members can access the directory and see files but cannot make modifications (e.g. add, delete, or edit files/directories)</td>
</tr>
<tr>
<td>$ chmod g+rwx /xdisk/PI</td>
<td>Group members are granted full read/write/execute privileges.</td>
</tr>
</tbody>
</table>

When an /xdisk allocation is created, a subdirectory is automatically generated for and owned by each individual group member. If the directory /xdisk/PI does not have group privileges, group members may not access the root directory, but may access their individual spaces by:

```
$ cd /xdisk/PI/netid
```

If a user joins the group after the xdisk was created and /xdisk/PI is not writeable for group members, contact our consultants and they can create one.

Typically when an /xdisk allocation is created, it will automatically generate a directory for each group member. In the unlikely event that it doesn't or, more commonly, a group member is added after the allocation has been created, either the PI may manually create a directory or, if the root directory is group writable, the user may create one themselves. If the group's /xdisk does not have full group permissions, the PI may run:

```
$ mkdir /xdisk/PI/netid
```

then can reach out to our hpc consultants to request an ownership change.

No, the full /xdisk allocation is available for every member of the group. It's up to group members to communicate with one another on how they want to utilize the space.

xdisk is a temporary storage space available to your research group. When it's close to its expiration date, notifications will be sent to all members of your group. For detailed information on xdisk allocations, see: Storage

xdisks are managed by your group's PI by default. This means if you want to request an xdisk or modify an existing allocation (e.g., extending the time limit or increasing the storage quota), you will need to consult your PI. Your PI may either perform these actions directly or, if they want to delegate xdisk management to a group member, they may do so by following the instructions under Delegating xdisk Management Rights.

To modify your allocation's time limit or storage quota, your PI can either do so through the Web Portal under the Storage tab, or via the command line. If your PI would like to delegate management rights to a group member, they may follow the instructions under Delegating xdisk Management Rights. Once a group member has received management rights, they may manage the allocation through our web portal.
If you're getting errors using xdisk commands in a terminal session, check that you are on a login node. If you are on the bastion host (hostname: gatekeeper), are in an interactive session, or are on the filexfer node, you won't be able to check or modify your xdisk. When you are on a login node, your terminal prompt should show the hostname `junonia` or `wentletrap`. You can also check your hostname using the command:

```
$ hostname
```

If you're trying to extend your group's allocation but are seeing something like:

```
(puma) [netid@junonia ~]$ xdisk -c expire -d 1
invalid request_days: 1
```

for every value you enter, your xdisk has likely reached its maximum time limit. To check, go to portal.hpc.arizona.edu, click **Manage XDISK**, and look at the box next to **Duration**. If you see 300, your allocation cannot be extended further.

If your allocation is at its limit, you will need to back up your data to external storage (e.g., a local machine, lab server, or cloud service). Once your xdisk has expired (either by expiring or through manual deletion), you can immediately create a new allocation and restore your data. Detailed xdisk information can be found on our [Storage page](https://portal.hpc.arizona.edu/). You may also want to look at our page on [Transferring Data](https://portal.hpc.arizona.edu/). No, once an xdisk has reached its time limit it will expire. It's a good idea to start preparing for this early by making frequent backups and paying attention to xdisk expiration emails.

Once an xdisk expires, all the associated data are deleted. Deleted data are **non-retrievable since HPC is not backed up**. It's advised to keep frequent backups of your data on different platforms, for example a local hard drive or a cloud-based service like [Google Drive](https://drive.google.com), or (even better) both!

Free Google Drive storage will be going away in 2023 and we are transitioning to AWS as a Tier 2 storage solution. We will continue to support researchers with Google Drive during this transition. See [Tier 2 Storage](https://portal.hpc.arizona.edu/) for information on the new rental storage option.

Before your group's xdisk expires, you'll want to make an external backup of anything you need to keep. External storage options include personal computers, lab servers, external hard drives, or cloud services such as Google Drive or AWS.

If you're moving large quantities of data, Globus is a great option. We have instructions in our [storage documentation](https://portal.hpc.arizona.edu/) for setting up and using this software.

We **strongly** recommend making archives (.tar, .zip, files etc.) of large directories prior to transferring them off the system. In general, transfer software struggles with moving many small files and performs much more efficiently moving fewer large files. You will get the better transfer speeds (sometimes by orders of magnitude) if you compress your files prior to transferring them. This can be done on our filexfer node which is designed for large file management operations (hostname: `filexfer.hpc.arizona.edu`).

Yes, a new xdisk may be requested immediately after the old partition expires. Data, however, may not be transferred directly from the old partition to the new one.

No, only one xdisk may be active per PI at a given time.