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File Systems

Pleiades Home Filesystem

Summary: You automatically have a home directory on Pleiades, with a quota of 8-10 GB of storage. For temporary storage of larger files, use the /nobackupp file systems. For long-term storage, use the Lou mass storage systems.

The home filesystem on Pleiades is an SGI NEXIS 9000 filesystem. It is NFS-mounted on all of the Pleiades front-end systems (PFEs), bridge[*1-4*], and compute nodes.

Once you are granted an account on Pleiades, your home directory is set up automatically during your first login.

Quota Limits and Policy

Disk space quota limits are enforced on the home filesystem. By default, the soft limit is 8 GB and the hard limit is 10 GB. There are no inode limits on the home filesystem.

To check your quota and usage on your home filesystem, do the following:

```
%quota -v
Disk quotas for user username (uid xxxx):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
saturn-ib1-0:/mnt/home2
                7380152  8000000 40000000          190950       0       0
```

The NAS quota policy states that if you exceed the soft quota, an email will be sent to inform you of your current usage and how much of the grace period remains. It is expected that you will occasionally exceed your soft limit; however, after 14 days, users who are still over their soft limit will have their batch queue access to Pleiades disabled. If you believe that you have a long-term need for higher quota limits on Pleiades, send an email justification to support@nas.nasa.gov. This will be reviewed by the HECC Deputy Project Manager, Bill Thigpen, for approval.

NOTE: For temporary storage of larger files, or a large number of files, use your /nobackupp directory. For normal long-term file storage, transfer your files to the Lou mass storage systems.

See also: Quota Policy on Disk Space and Files.

TIP: If you receive the following error when logging into Pleiades...

```
/usr/X11R6/bin/xauth:  error in locking authority file /u/username/.Xauthority
```

...you won't be able to run X applications. This error is most likely caused by your home filesystem quota being exceeded and you will have to decrease your disk usage to eliminate this error.

Backup Schedule

Files on the home filesystem are backed up daily.

Pleiades Lustre Filesystems

Summary: The Lustre filesystems on Pleiades are called "nobackup." As the name suggests, these filesystems are for temporary use, and are not backed up. Lustre can handle many large files, but you cannot store those files on Pleiades; if you want to save them, move them to Lou.

Pleiades has several Lustre filesystems (**`/nobackupp[`*`1-6`*`]`**) that provide a total of about 6.795 petabytes of storage and serve thousands of cores. These filesystems are managed under Lustre software version 1.8.6.

Lustre filesystem configurations are summarized at the end of this article.

WARNING: As the names suggest, these filesystems are not backed up, so any files that are removed *cannot* be restored. Essential data should be stored on Lou[*1-2*] or on other, more permanent storage.

Which /nobackup Should I Use?

Once you are granted an account on Pleiades, you will be assigned to use one of the Lustre filesystems. Find out which Lustre filesystem you have been assigned to by typing the following:

```
pfe1% ls -l /nobackup/your_username
lrwxrwxrwx 1 root root 19 Feb 23  2010 /nobackup/username -> /nobackupp2/username
```

In the above example, the symlink from **`/nobackup`** to **`/nobackupp2`** shows that the user's assigned nobackup system is **`/nobackupp2`**.

Default Quota and Policy on /nobackup

Disk space and inodes quotas are enforced on the /nobackup filesystems. The default soft and hard quota limits for inodes are 75,000 and 100,000, respectively. Those for the disk space are 500 gigabytes and 1 terabyte, respectively. To check your disk space and inodes usage and quota on your /nobackup, use the **`lfs`** command and type the following:

```
%lfs quota -u username /nobackup/username
Disk quotas for user username (uid nnnn):
   Filesystem  kbytes       quota   limit   grace   files   quota   limit   grace
/nobackup/username 1234  530000000 1100000000    -     567   75000  100000       -
```

The NAS quota policy states that if you exceed the soft quota, an email will be sent that lists your current usage and remaining grace period. It is expected that users will occasionally exceed their soft limit, as needed; however after 14 days, users who are still over their soft

limit will have their batch queue access to Pleiades disabled.

If you anticipate having a long-term need for higher quota limits, please send a justification via email to support@nas.nasa.gov. This will be reviewed by the HECC Deputy Project Manager for approval.

For more information, see also, Quota Policy on Disk Space and Files.

NOTE: If you reach the hard limit while your job is running, the job will die prematurely without providing useful messages in the PBS output/error files. A Lustre error with code **`-122`** in the system log file indicates that you are over your quota.

In addition, when a Lustre filesystem is full, the jobs writing to it will hang. A Lustre error with code **`-28`** in the system log file indicates that the filesystem is full. The NAS Control Room staff normally will send out emails to those using the most space, asking them to clean up their files.

Lustre File Systems Configurations

In the table below, /nobackupp[*1-6*] are abbreviated as nbp[*1-6*]. P=Petabytes; T=Terabytes

Pleiades Lustre Configurations

Filesystem	nbp1	nbp2	nbp3	nbp4	nbp5	nbp6
# of MDSes	1	1	1	1	1	1
# of MDTs	1	1	1	1	1	1
size of MDTs	0.9T	0.9T	0.6T	0.6T	0.8T	0.9T
# of usable inodes on MDTs	~256x10^6	~256x10^6	~173x10^6	~173x10^6	~512x10^6	~256x10^6
# of OSSes	8	8	8	8	8	8
# of OSTs	120	120	60	60	120	120
size/OST	15T	15T	7.1T	7.1T	15T	7.1T
Total Space	1.7P	1.7P	424T	424T	1.7P	847T
Default Stripe Size	4M	4M	4M	4M	4M	4M
Default Stripe Count	1	1	1	1	1	1

NOTE: After January 13, 2011, directories without an explicit stripe count and/or stripe size adopted the new stripe count of 1 and stripe size of 4MB. However, old files in that directory retain their old default values. New files that you create in these directories will adopt the new default values.

Each Pleiades Lustre filesystem is shared among many users. To get good I/O performance for your applications and avoid impeding the I/O operations of other users, read the related articles listed below.

Columbia Home Filesystems

Columbia Phase Out:

As of Feb. 8, 2013, the Columbia21 node has been taken offline as part of the Columbia phase out process. Columbia22-24 are still available. If your script requires a specific node, please make the appropriate changes in order to ensure the success of your job.

Columbia's home fileystem (**/u/username**) is NFS-mounted on the Columbia front-end (cfe2) and compute nodes (Columbia*21-24*).

Once a user is granted an account on Columbia, the home directory is set up automatically during his/her first login.

Quota and Policy

Disk space quota limits are enforced on the home filesystem. By default, the soft limit is 4 GB and the hard limit is 5 GB. There are no inode limits on the home filesystem.

To check your quota and usage on your home filesystem, do:

```
%quota -v
Disk quotas for user username (uid xxxx):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
  ch-rg1:/home6    4888  4000000 5000000             294       0       0
```

The quota policy for NAS states that if you exceed the soft quota, an email will be sent to inform you of your current usage and how much of your grace period remains. It is expected that a user will occasionally exceed their soft limit as needed; however after 14 days, users who are still over their soft limit will have their batch queue access to Pleiades disabled. If you believe that you have a long-term need for higher quota limits, you should send an email justification to support@nas.nasa.gov. This will be reviewed by the HECC Deputy Project Manager, Bill Thigpen, for approval.

The quota policy for NAS can be found here.

WARNING: If you receive the following error when logging into Columbia:

```
/usr/X11R6/bin/xauth:  error in locking authority file
/u/username/.Xauthority
```

you won't be able to run X applications. This error is most likely caused by your home filesystem quota being exceeded and you will have to decrease your disk usage to eliminate this error.

Backup Policy

Files on the home filesystem are backed up daily.

Columbia CXFS Filesystems

Columbia Phase Out:

As of Feb. 8, 2013, the Columbia21 node has been taken offline as part of the Columbia phase out process. Columbia22-24 are still available. If your script requires a specific node, please make the appropriate changes in order to ensure the success of your job.

Columbia CXFS filesystems (**/nobackup[*1-2*][*a-i*]**) are shared and accessible from cfe2 and Columbia*21-24*. This allows user jobs to be load-balanced across Columbia's systems without forcing users to move their data to a particular Columbia system.

Users will have a **/nobackup** directory on one of these shared file systems. To find out where your **/nobackup** directory is, log in to the front-end node and type the following shell command:

```
cfe2% ls -d /nobackup[1-2][a-i]/$USER
/nobackup1f/username/
```

In this example, the user is assigned to **/nobackup1f**.

Default Quota and Policy on /nobackup

Disk space and inodes quotas are enforced on the CXFS **/nobackup[*1-2*][*a-i*]** filesystems. The default soft and hard limits for inodes are 25,000 and 50,000, respectively. Those for disk space are 200GB and 400GB, respectively. To check your disk space and inodes usage and quotas on your CXFS filesystem, do the following:

```
cfe2% quota -v
Disk quotas for user username (uid xxxx):
     Filesystem  blocks   quota   limit   grace   files   quota   limit   grace
/dev/cxvm/nobackup1f
               1673856  210000000 420000000             10973   25000   50000
```

The NAS quota policy states that if you exceed the soft quota, an email will be sent to inform you of your current usage and how much of your grace period remains. It is expected that users will occasionally exceed their soft limit, as needed; however after 14 days, users who are still over their soft limit will have their batch queue access to Columbia disabled.

If you anticipate having a long-term need for higher quota limits, please send a justification via email to support@nas.nasa.gov. This will be reviewed by the HECC Deputy Project Manager for approval.

For more information, see also, Quota Policy on Disk Space and Files.

WARNING: As the names suggest, these filesystems are not backed up, so any files that are removed *cannot* be restored. Essential data should be stored on Lou*1-2* or onto other more permanent storage.