# GNU/Linux Workstations

The standard Lorentz Institute workstation runs the Fedora GNU/Linux operating system. The workstations are configured with pre-installed scientific and non-scientific software to maximize your productivity. You are allowed to install and/or build packages locally (directories to which you have writing access), but for system-wide installations you must file a request through our helpdesk or via email at support@lorentz.leidenuniv.nl.

We perform upgrades of the operating system of all workstations once a year usually starting in December. This is crucial for both security and latest software availability.

Although the workstations might differ in their hardware specifications, they are set so that you can switch from one to the other flawlessly. For instance, the home directories are not local to a particular machine, but they are hosted on a remote server and served as network file system (NFS) to all workstations. One of the immediate advantages of this configuration is that you can access any files in your home directory no matter the workstation you are working on. On the other hand, having the home directories mounted over the network can result in problems if the home file system is not accessible, such as in the event of a network disruption.

## Home disk

| Mount Point | User Space | Redundancy | Notes |
|---|---|---|---|
| /home | /home/<username> | RAID, 12:00 PM Daily Snapshots with 7 day expiration | NFS, automounted, quota |

Each user has an **allocated quota** on the home disk depending on their role within the Lorentz Institute. The standard quota is 4GB, nonetheless it is possible to request extra space. To check your home disk usage type `quota -s`. Use `du -h /home/<username> | sort -rh | head` to compile a list of the ten largest files in your home directory.

We advise you do not store large files in your home directory.

### Home disk data availability

The Lorentz Institute home directories are hosted on a iSCSI array of disks arranged in a RAID configuration. Automatic snapshots (a sort of incremental backup) of the whole home disk are performed everyday at around 12:00 PM. Each snapshot has a 7-day expiration and as such the total number of snapshots stored on our system at any time is 7.

## Data disks

Each workstation could have one or more local disks to offer large-data storage. The data disks of one workstation are also accessible from any other workstation

| Mount Point | User Space | Redundancy | Notes |
|---|---|---|---|
| /data[1,..,n] | /data[1,..,n] | None or RAID. Backups are your resposibility | Local, no quota, mounted at boot |
| /net/<workstation-name>/data[1,..,n] | /net/<workstation-name>/data[1,..,n] | None or RAID*. Backups are your resposibility | NFS, no quota, automounted |

In most cases, **but not always**, /data2 is configured as the mount point of a RAID[1|5] stack, meaning that data in it have a certain level of redundancy which can protect against disk failures. Note however, that storing all data on /data2 in RAID configuration will still not prevent data loss if all disks in the array `die', your computer tower gets destroyed by a fire or in any other disastrous event. **You are strongly encourage to keep your personal backup of any important data.**

To check if any of your workstation's disks are arranged in a RAID configuration type `cat /proc/mdstat`.

Note that in the table above <workstation-name> can either be a short workstation name or a full name including its domain with no difference. Disk mounting via the `/net/<workstation-name>` scheme is managed by autofs. This means that those disks will not be mounted until there is an attempt to access them, for instance by contents listing (ls) or change of working directory (cd).

# Data storage disk

Our data-storage disk can be accessed according to the following schema

| Mount Point | Total Size | Redundancy | Notes |
|---|---|---|---|
| /disks/misc | 5 TB | RAID, 1:00 AM Daily Snapshots with two-day expiration | NFS, no quota, automount |
| iRODS | 20 GB (per user) | iRODS | iCommands, WebDAV, FUSE |

If you work on xmaris, there is an extra storage space that you could use while you work on the cluster. For mor einfo, please read here.

# Shell interpreters

The Lorentz Institute workstations come with a set of pre-installed shell interpreters. Your login shell can be chosen upon registration of your Lorentz account (HL 409b) otherwise it will default to `bash`. In any case, it is possible to use a different shell interpreter at any time by just invoking it, e.g. `csh`.

If you want to change your default interpreter use `chsh` and follow the on-screen indications.

# Available software

A variety of softwares are available on your workstation. Some software is installed locally on your workstation others are provided remotely in the form of *modules* from our software disk either via the sfinx environment or via the EasyBuild framework.

While locally installed softwares can be launched directly because already loaded in your environment, *sfinx*- and *EasyBuild*- built software must be loaded in your environment first via the `module` command. For more information consult `man module`.

If sfinx is not installed for your account, you might see less modules available on your workstation. In this case make a backup of your settings (for instance .bashrc, .cshrc, etc...) and install sfinx.

# Help

Should you need assistance operating your workstation, please do not hesitate to request help via our helpdesk application.

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