Access HPC systems

1. Getting account

To begin utilizing the clusters, you need to initiate a request for HPC access.

- Access to your account can be granted through either a login and password combination or a login with a certificate. Certificates offer enhanced security compared to passwords because they are based on cryptographic keys that are much harder to compromise.

Task 1: Open and distribute login/passwords or certificates for the participants

2. Connecting to a cluster using SSH

One of the most flexible methods for executing commands and sending tasks to one of the clusters involves employing SSH, a widely used approach for accessing computers remotely running the Linux operating system. To establish a connection with another machine using SSH, it is necessary to have an SSH client program installed on your device.

- macOS and Linux include a pre-installed command-line SSH client,
- Windows users have access to several graphical SSH clients, such as PuTTY, MobaXterm, Cygwin, Bitvise SSH Client or WinSCP.

Task 2: Install WinSCP and establish an ssh connection with the HPC cluster

3. Transferring files

To transfer files to and from the clusters, you have a couple of options:

- Utilize a program that supports either the SCP or SFTP protocols, or both, to copy or move files between your local machine and the cluster. This allows for seamless file transfer operations.
- Alternatively, you can employ the SCP or SFTP commands directly from your terminal or command prompt to initiate file transfers between your machine and the cluster. This method offers flexibility and direct control over the transfer process.

Task 3: To transfer files to and from the cluster using the WinSCP and explain the commands

To upload, you transfer from your local machine to the remote cluster:

- scp /home/user/file.txt USER@SERVER_NAME:/home/$USER/

To download, you transfer from the remote cluster to your local machine:

- scp USER@SERVER_NAME:/home/$USER/file.txt /home/user/

To copy a whole directory, we add the -r flag, for “recursive”

- scp -r USER@SERVER_NAME:/home/$USER/my_dir /home/user

4. Filestores in HPC clusters

Every HPC user can access different storage areas, such as

- Home directories: Personal storage with backups and snapshots, accessible from multiple nodes and shared between clusters.
- Fastdata areas: High-performance shared filesystem optimized for simultaneous reading and writing of large files from multiple nodes.
- Scratch directories: Temporary storage per node, ideal for handling numerous small files within a single job.
- Community areas for software: Cluster-wide storage for sharing software among users.

Task 4: To create a file on one computational node and show it to other nodes via SSH in order to explain parallel file systems which are widely used in HPC systems